

INFORMATION SYSTEM
ANNUAL PRESENTATION 1995

INPUT

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INPUT is a worldwide consulting and market research firm uniquely focused on the information technology services and software markets. Executives in many technically advanced companies in North America, Europe, and Japan rely on INPUT for data, objective analysis, and insightful opinions to support their business plans, market assessments, and technology directions. By leveraging INPUT's considerable knowledge and expertise, clients make informed decisions more quickly, and benefit by saving on the cost of internal research.

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Consulting services are provided by more than 50 professionals in major international business centers. Clients retain INPUT for custom consulting/proprietary research, subscription-based continuous advisory programs, merger/acquisition analysis and detailed studies of U.S. federal government IT procurements.

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INFORMATION SYSTEMS (I.S.) DIRECTIONS

Peter A. Cunningham
President
INPUT

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This is INPUT's annual presentation on directions in the information systems industry. It includes our distillation of the issues and plans affecting the industry which have been identified through the 1985 research. An important feature is the interactive nature of the presentation.

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CONTENTS

- Introduction
- Strategic Trends in IS
- IS for Competitive Advantage
- Commercial Opportunities
- Conclusion

The introduction discusses briefly, INPUT's 1985 research base and plans for 1986. It then analyses the industry slowdown or "slump", some have called it. Is it permanent or temporary? What has caused it? INPUT believes there are some fundamental changes in the buying environment which have caused the change.

"Strategic Trends in IS" includes a discussion of the management issues and objectives for IS - the role of planning is examined particularly in this context. Changes in budgets from 1985 to 1986 are predicted. Other trends examined include functional distribution, micro-mainframe developments, IBM connectivity strategies, voice/data integration, and IS organizational changes.

In IS for Competitive Advantage specific examples of company's use of IS in this context are examined.

The conclusion summarizes this presentation and gives some recommendations for client action.



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INTRODUCTION

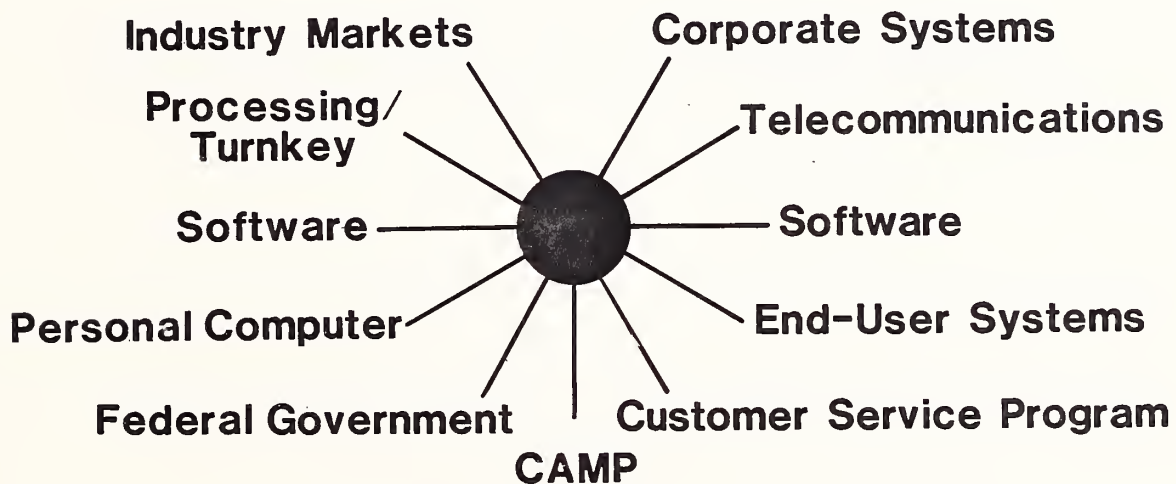
INPUT RESEARCH SOURCES

- **Subscription Programs**
- **Multiclient Projects**
- **Custom Consulting**

Subscription programs from INPUT provide the base of research for this presentation. The nature of these programs is changing from 1985 to 1986 in some fundamental ways. There will be fewer reports, but those that are developed will be in more depth. For each report project there will be direct client interface through meetings and teleconferencing. The issues will be important ones and topical.

The emphasis is on more specific information rather than general information. Thus each client company will have an analysis of status of IS in its industry.

INPUT SUBSCRIPTION PROGRAMS



INPUT's subscription programs emphasize software application and services. Even its approach to Information Systems (IS) is to examine IS as a service - how can it best benefit its parent organization. Greater emphasis is being placed on vertical industry use of and markets for products and services, particularly, in the federal government and banking and finance areas.

Vendor Products and Services

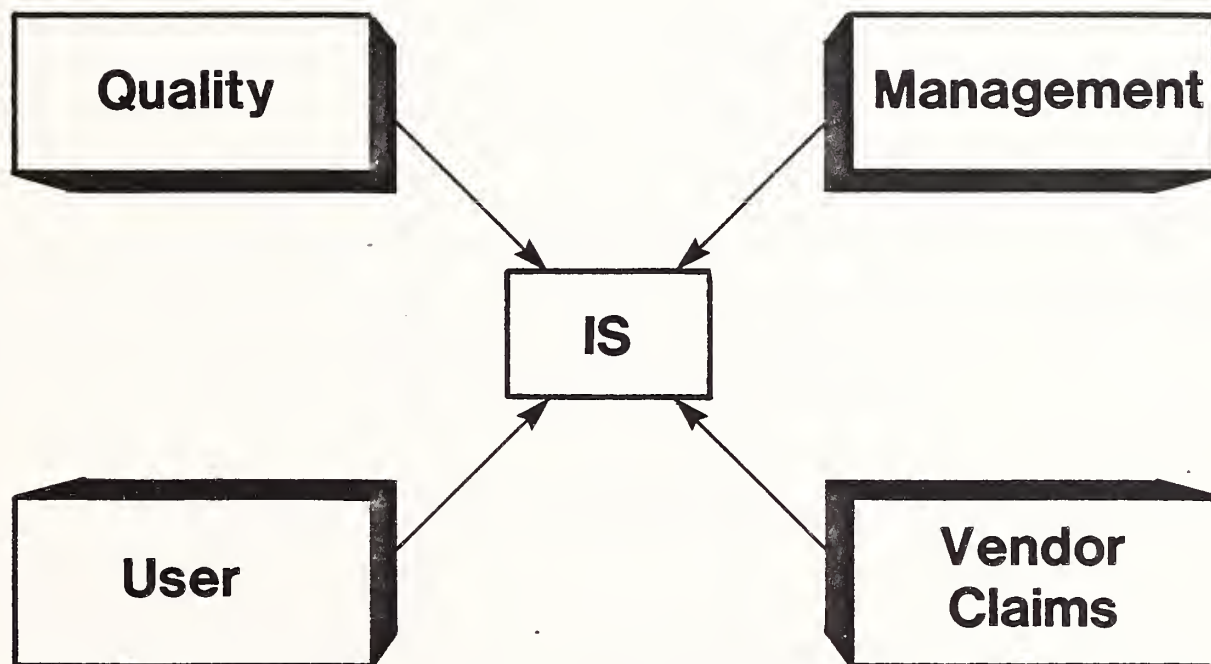
IS Planning
Industry Budgets and Plans
Industry Markets

Vendor level of service
- Hardware maintenance
- Software maintenance
Information Services Market
Software products
Professional services
Computer/communication(network) services
Turnkey systems (VAR)

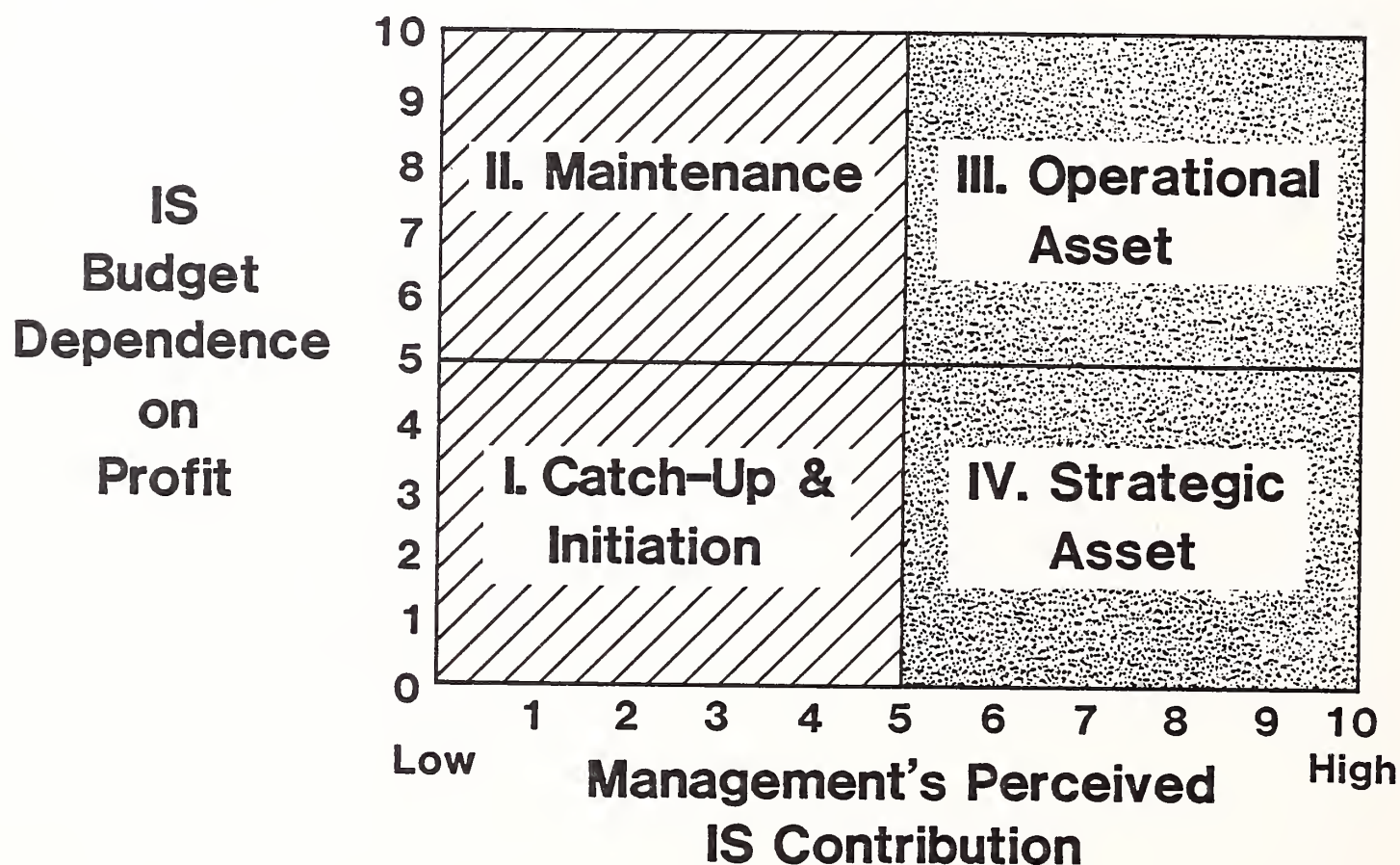
INPUT®

STRATEGIC TRENDS

I.S. PRESSURES



I.S.' CORPORATE CONTRIBUTION



▨ IS Unavoidable Cost

▤ IS Corporate Asset

INPUT's 1985 Survey shows that IS budget dependence on profit has a value of 5, mid-way, while management's perceived IS contribution is fairly high at 7. However, that is the level IS management thinks corporate management perceives IS - INPUT's opinion is that this is largely overstated.

There is quite a variation by industry with transportation and utilities generally in segment 1, while banking and services are firmly in 2.

MAJOR I.S. ISSUES**STRATEGIC****Cost Containment****Government Deregulation****Non-Traditional Competitors****Apply New Technology****Network Demands**

These strategic IS issues apply beyond the next 3 years. Cost containment both within IS and corporate-wide is the number 1 issue today although it does not preempt expenditures as long as they have demonstrable benefits. Government deregulation affects competition in some industries and reporting in almost all. Non-traditional competitors are appearing, e.g. retailers entering the funds transfer marketplace; this is fed by new IS activities. A strategic IS issue of basic importance is how to apply new technology to reduce costs, obtain a competitive advantage, or to introduce new products. An increasingly important issue is that of network demand because of the interface with office systems and the feedback loop which shows that improved delivery increases the demand.

MAJOR I.S. ISSUES**TACTICAL****Cost Containment****Information Delivery****Integrate IS and Corp. Planning****Customer Oriented Systems Architecture****Management Perception of IS**

Cost containment is still the number 1 tactical issue for the next 1-3 years. Information delivery is the next most important, meaning, getting the right information to the right people at the right time in the proper format.

To integrate IS and Corporate Planning the corporate visibility of IS must be raised and its image improved. IS must be changed from a "cost oriented" stature to a "revenue generating" position.

Today system architecture is product or functional in orientation - this must be changed. The customer (user) base within the organization can then be exploited.

As indicated above management perception of IS must be changed from an unavoidable cost to an asset. The executive in charge must move from being regarded as a technician to a business person.

MAJOR I.S. ISSUES**OPERATIONAL****Improve Productivity****Contain Costs****Improve Information Delivery****Establish Customer Oriented Data Bases****Expand Use of New Technology**

Improving productivity and containing costs are traditional issues. The only changes are evolutionary - moving to emphasis on "corporate" productivity and costs as opposed to just IS.

The issue of data bases (including ownership of "data") is just surfacing in customer (user) organizations. Especially with information center and outside data base use growing there is pressure to establish and manage internal, shared data bases.

Expanding the use of new technology is tempered by the need to use proven techniques in order to mitigate risks. However, measured risks must be taken to improve market penetration.

I.S.' CHANGING ROLE

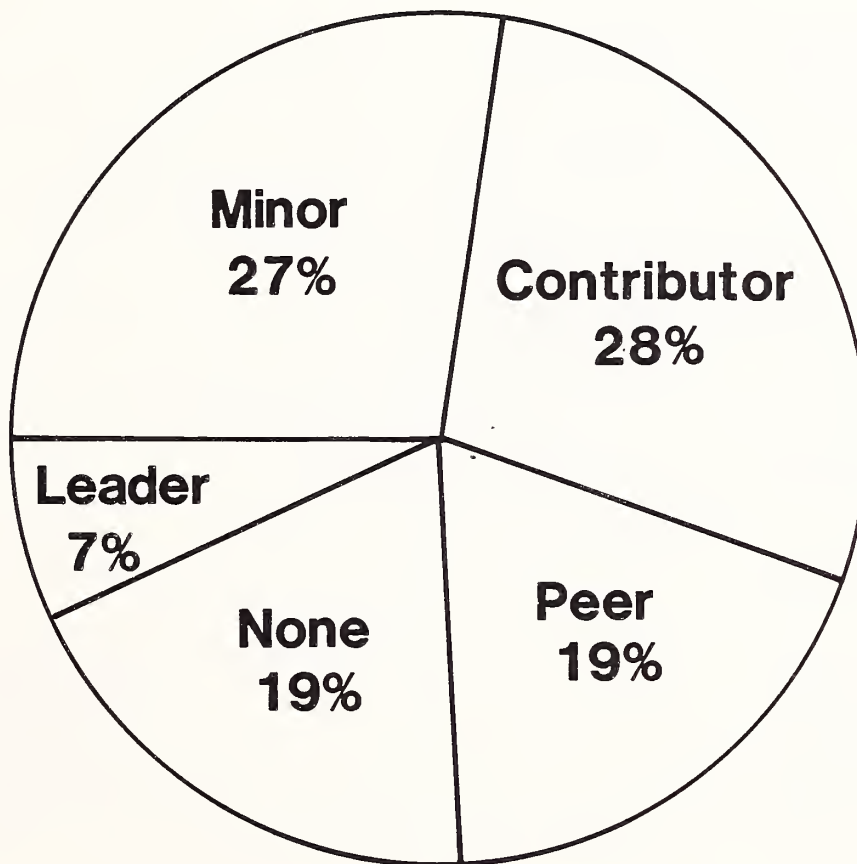
View: Operational —→ Strategic

Reporting: Finance —→ COO

Function: Technician —→ Consultant

The corporate view is then that IS will be an asset - different from other "staff" or "cost" functions. IS is part of the operational asset base of the company. It will be represented as part of the top corporate planning committee.

The role of the central IS organization will have a significant consulting component for other operating units.

I.S.' ROLE IN CORPORATE PLANNING**Percent of Responses**

This is the current perceived role of IS in corporate planning - it is probably grossly overstated but still only has 20% of companies reporting that they have reached the objective.

CURRENT I.S. ENVIRONMENT

- Central Mainframes
- Terminals
- Micros
- Office Automation
- Info. Center

**Single
Data
Center**

**Distributed
Information
Systems**

The current IS environment is fragmented - in some cases a mess! Independent, incompatible computer, office and communications systems litter the corporate landscape. Companies have as many as 100 separate data networks. Central mainframes are the most stable and best managed component because they have had the most attention over the longest period.

FUTURE I.S. ENVIRONMENT

- Central Mainframes
- Distributed Minis and DBMS
- Intelligent Workstations
- M-M Links
- DSD
- Office Systems
- LANs

**Single
Data
Center**

**Distributed
Information
Systems**

The future environment of distributed information systems is more complex still, but it is integrated. Connectivity is the key together with central planning and coordination. However, development and operation of IS will be occurring all over our organization - they will be part of the normal way of doing business for everyone.

IMPACT OF TECHNOLOGY

	IMMEDIATE	NEAR TERM	LONG- TERM
Relational Data Bases	Low	Low	Low/ Medium
Voice/Data Integration	Low	Low	Medium/ High
LAN	Low	Low	Low

There is very little activity in relational data bases - a lot of concern about performance exists today.

Voice/data integration is not there yet because of a lack of technology. Management has been integrated into one unit in over 50% of respondents this year.

LAN use is experimental except for PCs. There is a "wait and see" attitude, while the lack of standards creates problems.

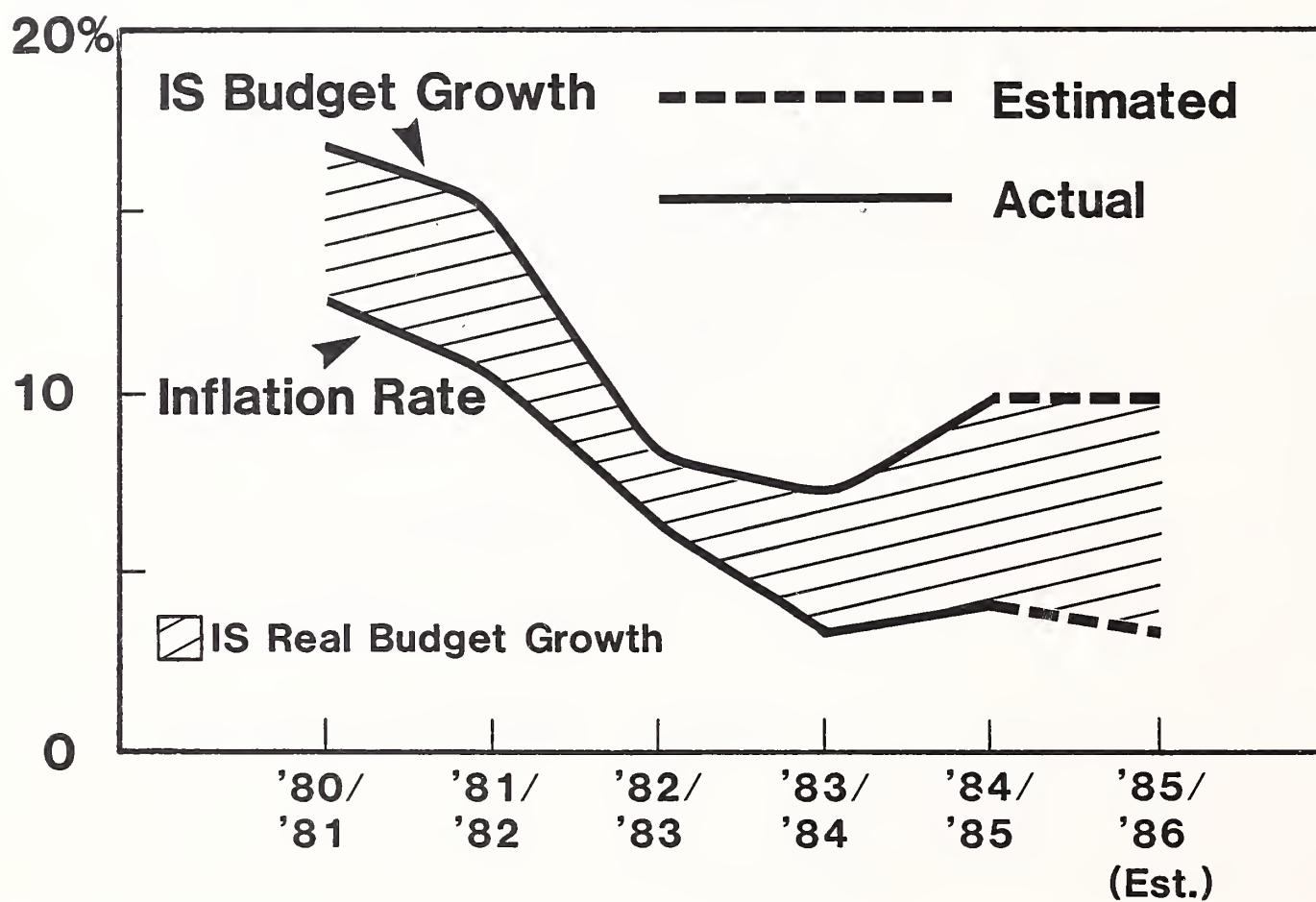
IMPACT OF TECHNOLOGY

	IMMEDIATE	NEAR TERM	LONG- TERM
End User Computing	High	Medium	Medium
Departmental Processing	Low	Low	High
Distributed Systems Development	Low	Medium	Medium

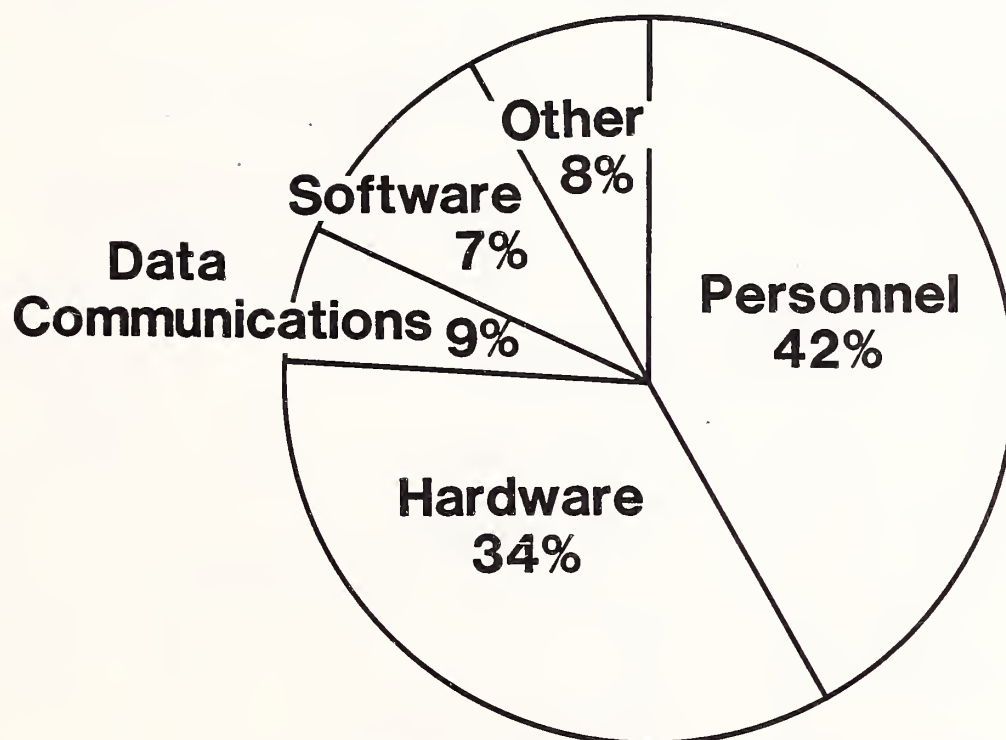
Respondents to this year's survey had interesting views on the impact of various technologies. The impact of end-user computing is high today because of initiation - it will then decline as it becomes more of a maintained environment. Departmental processing will only have a long term impact because of the application gap - the technology and organization are only bring worked on now.

DSD is in an experimental stage. It is not always appropriate and its organizational impact has not been addressed.

I.S. GROWTH VERSUS INFLATION



I.S. BUDGET DISTRIBUTION 1985



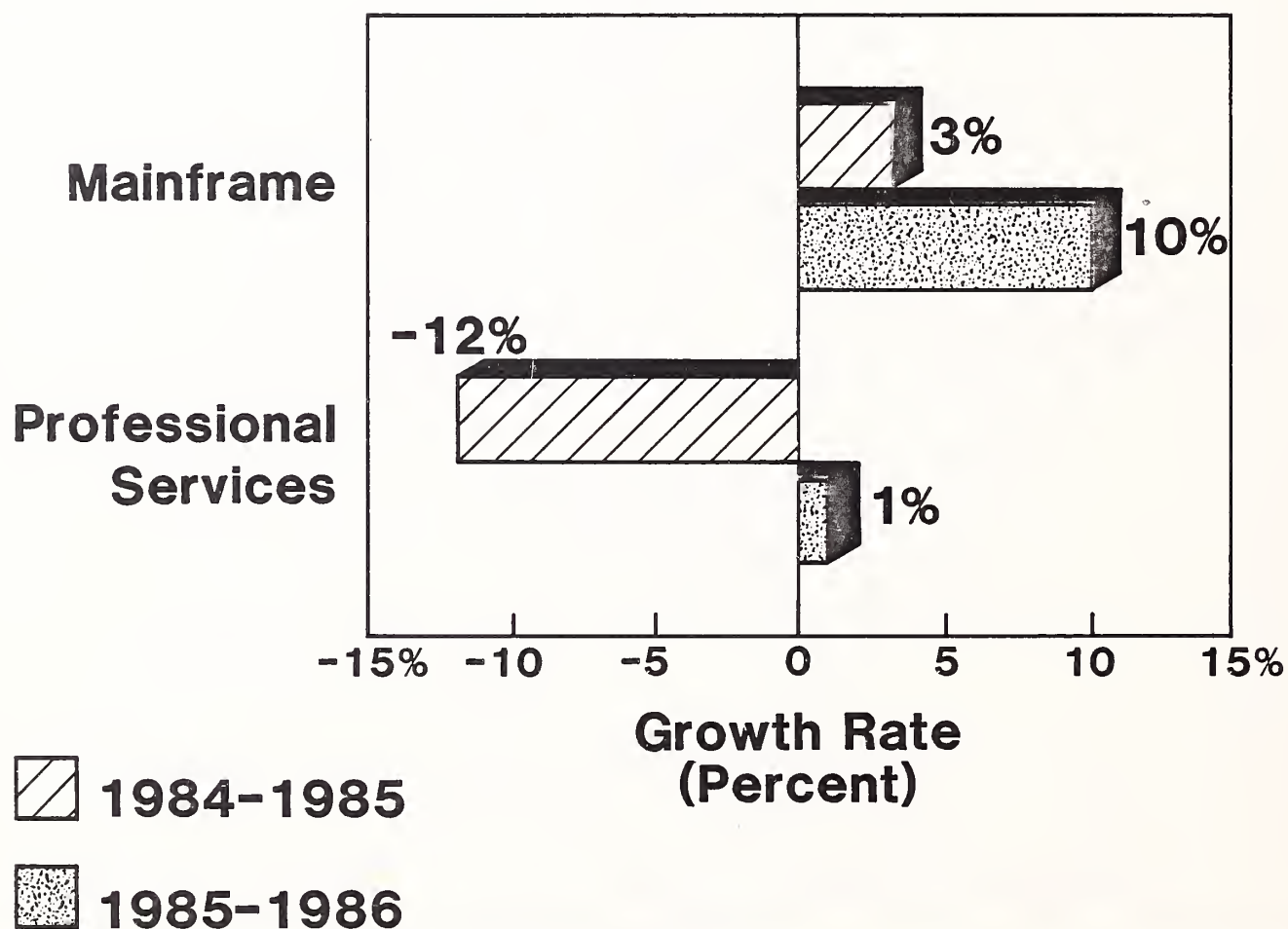
Percent of IS Budget

Budget Growth 1984-1985 - 10.0%

1985-1986 - 10.2%

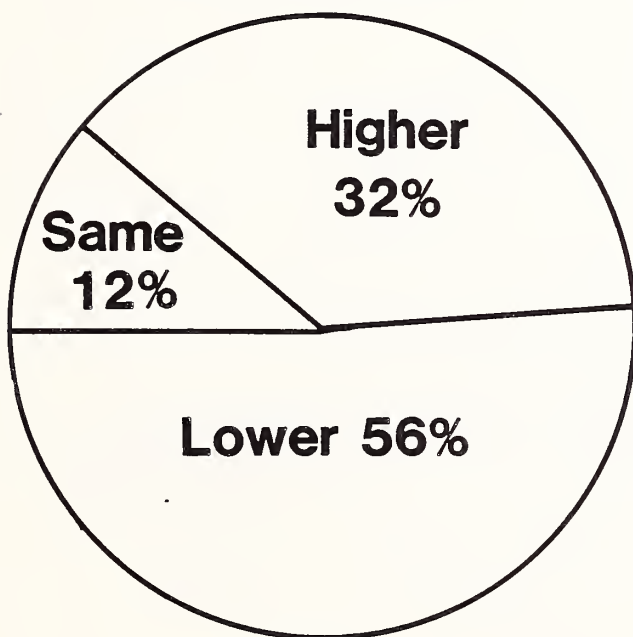
There has not been much change since 1984. Expected growth rates in personnel budget is 7%, hardware 10%, data communications 11%, software 5% (relatively low).

LARGEST CHANGE IN BUDGET GROWTH

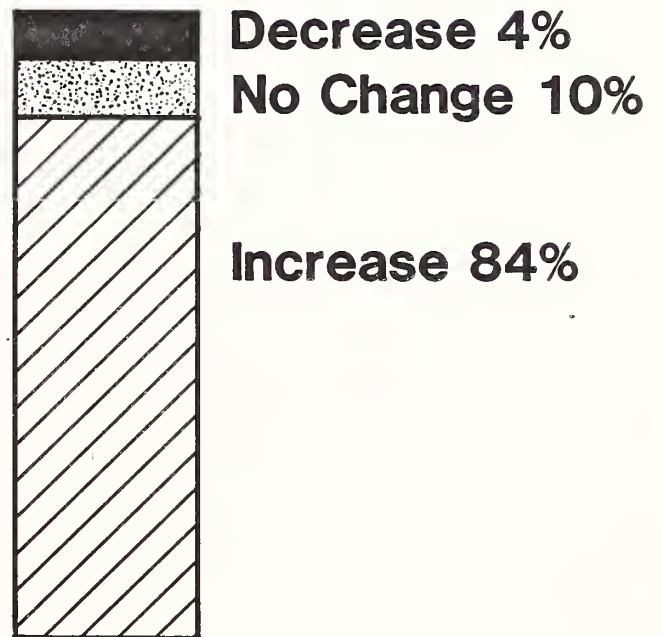


MOST BUDGETS WILL INCREASE BUT AT A LOWER RATE THAN IN 1985

Growth Rate

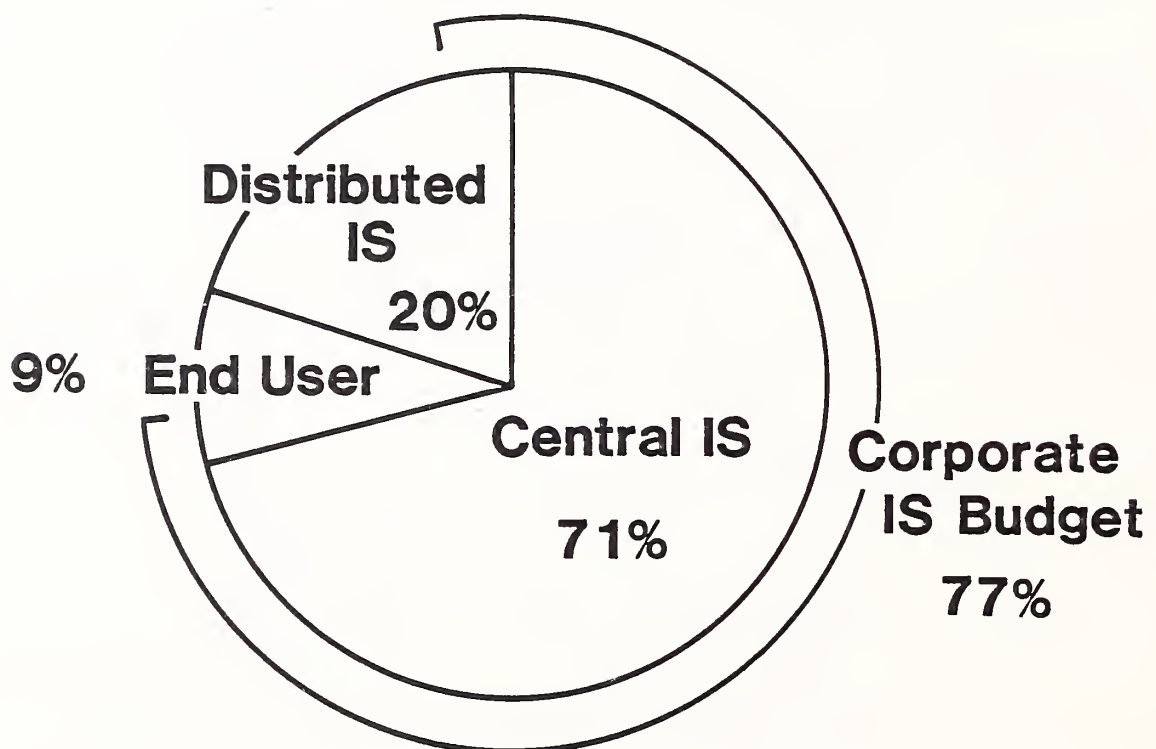


1986 Budgets



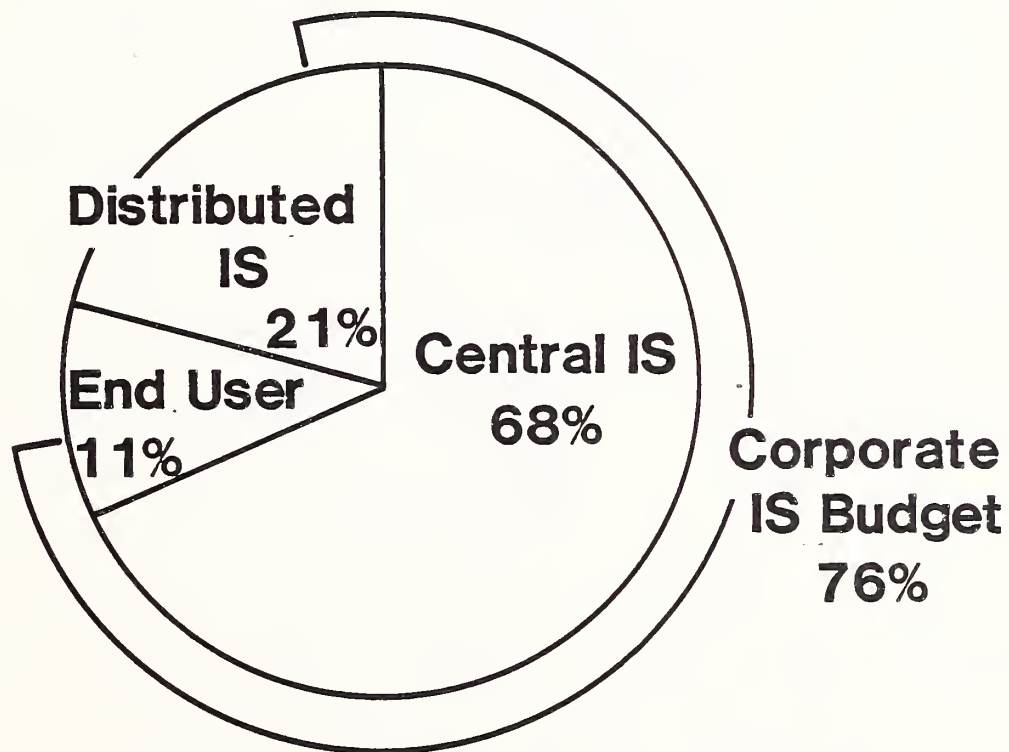
Percent of Responses

84% of respondents see an increase in their budgets in 1986, just about the same as last year. However, over half the respondents expect their increases to be less than in 1985 - a result that bodes ill for many vendors.

DISTRIBUTION OF I.S. EXPENSES**1985**

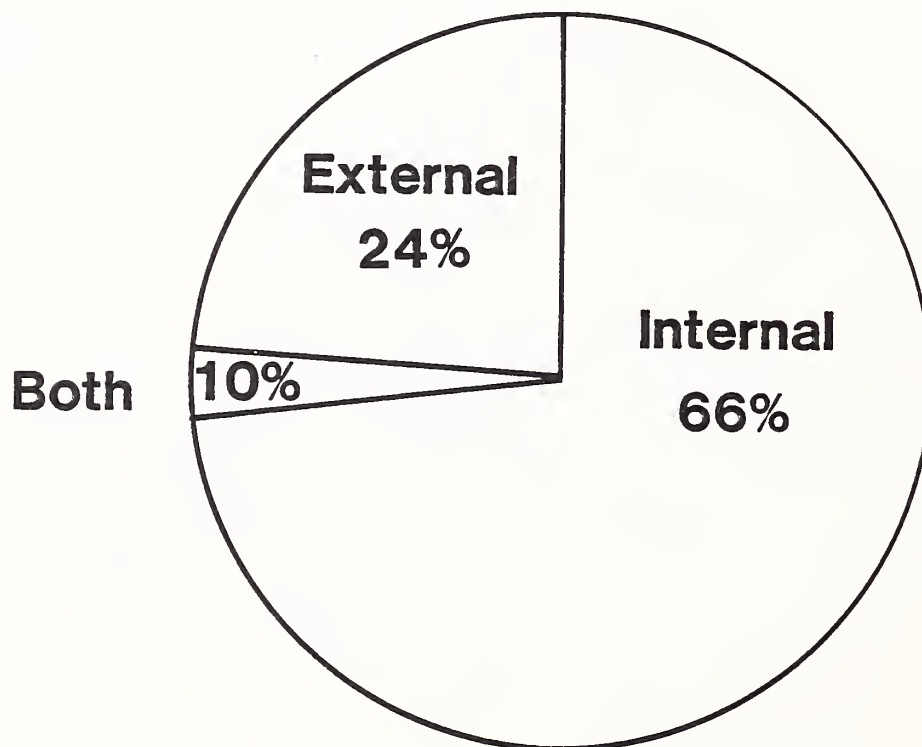
Corporate IS budget includes "central IS" and also about 20% of end-user and distributed IS expenses.

PROJECTED DISTRIBUTION OF I.S. EXPENSES 1986



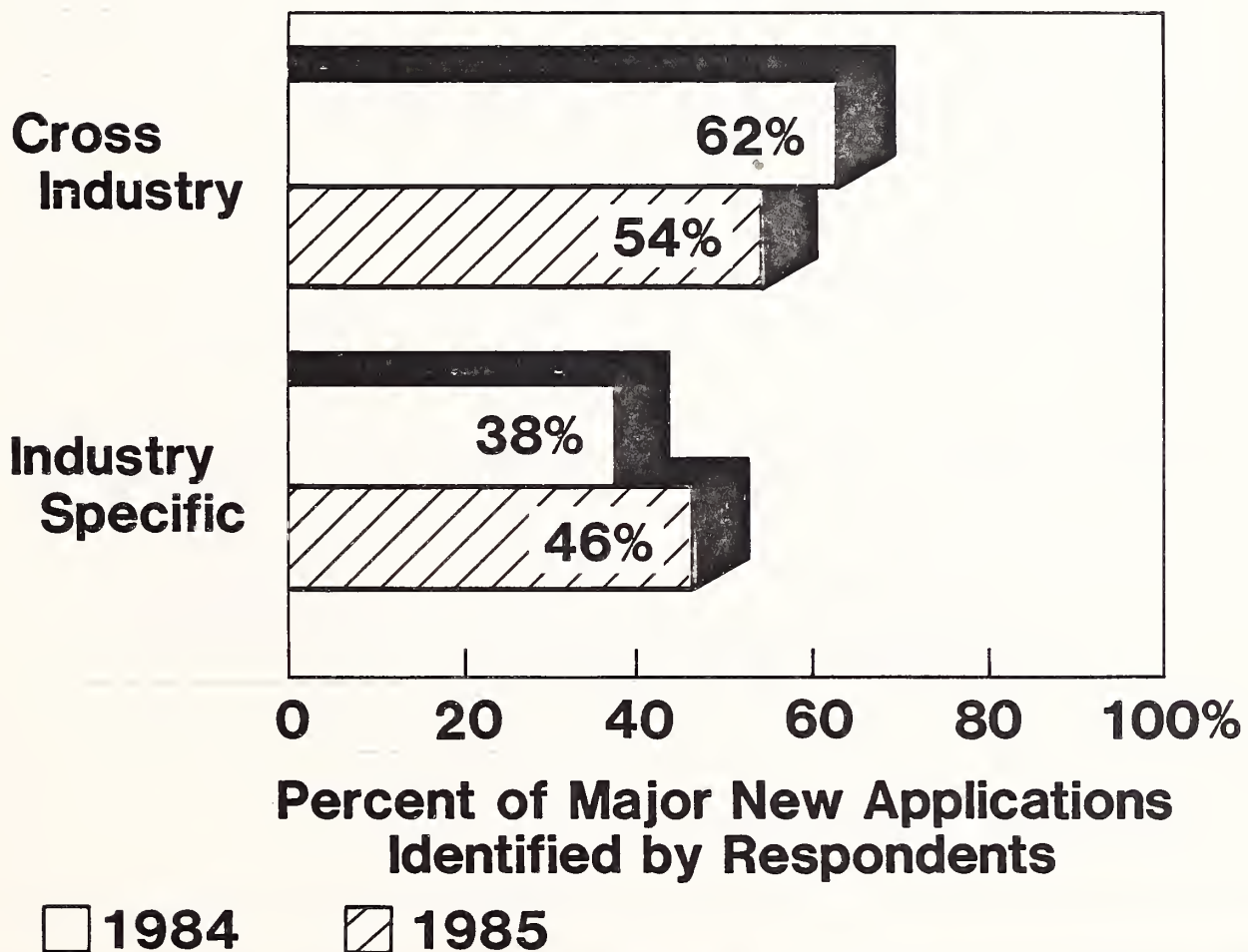
While the proportion of total IS expenses due to central IS is declining rapidly (from 71% to 68% in one year.) The corporate IS budget is staying at about the same proportion of total IS expenses. This is because corporate IS is increasing its budget control over end-user and distributed expenses faster than they are growing.

NEW APPLICATION DEVELOPMENT SOURCES 1985



About a third of respondents major projects will involve external application development sources in 1985, including software packages and professional services. This is still quite low and seems to be fairly stable.

MAJOR APPLICATION DISTRIBUTION (All Companies)



The cost range of application identified was \$1.5K to \$16 million.

"Industry specific" applications continue to grow as a proportion of major new applications needs. Again this reflects the increasing importance of IS from a competitive view point.

The most common cross-industry applications include "new" over such as "OA" and "DSS", as well as the traditional accounting/HR/billing applications.

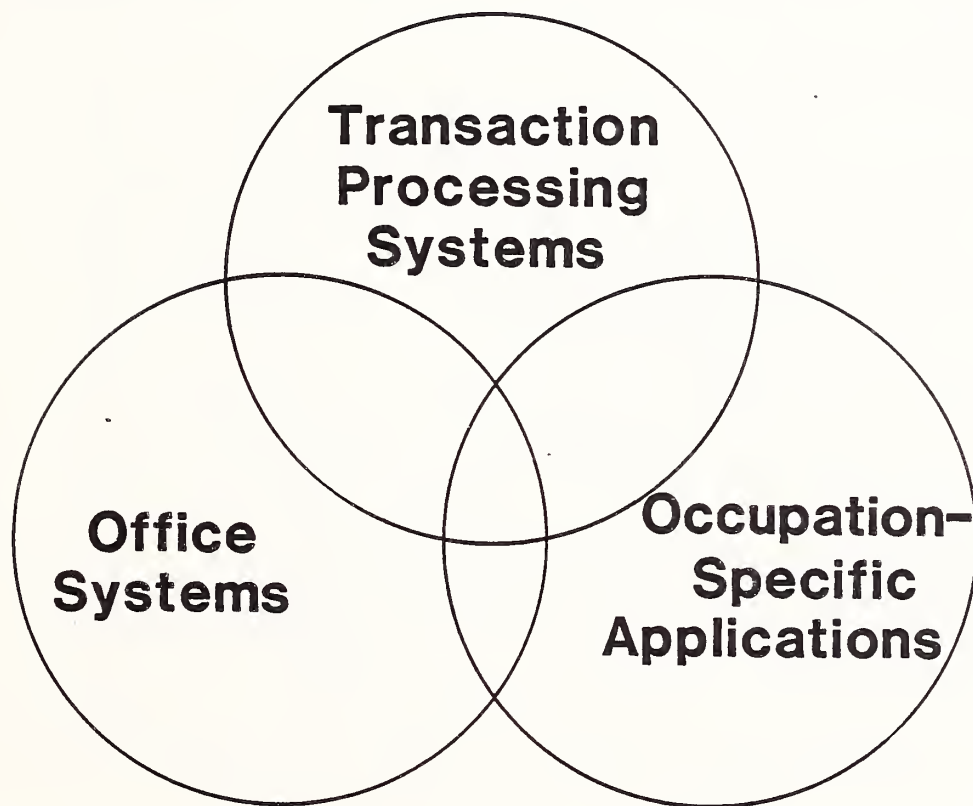
THE FUTURE OF END-USER COMPUTING

- **Distributed Systems Development**
- **Micro-Mainframe Links**
- **Modeling, Analysis, Graphics, Reporting**
- **Applications Prototyping**
- **Expert Systems**

The future of end-user computing involves more distributed systems development as knowledge and tools are distributed through the organization. Applications prototyping will be a key part of this. End-users may develop prototypes even when the ultimate development will be a central responsibility.

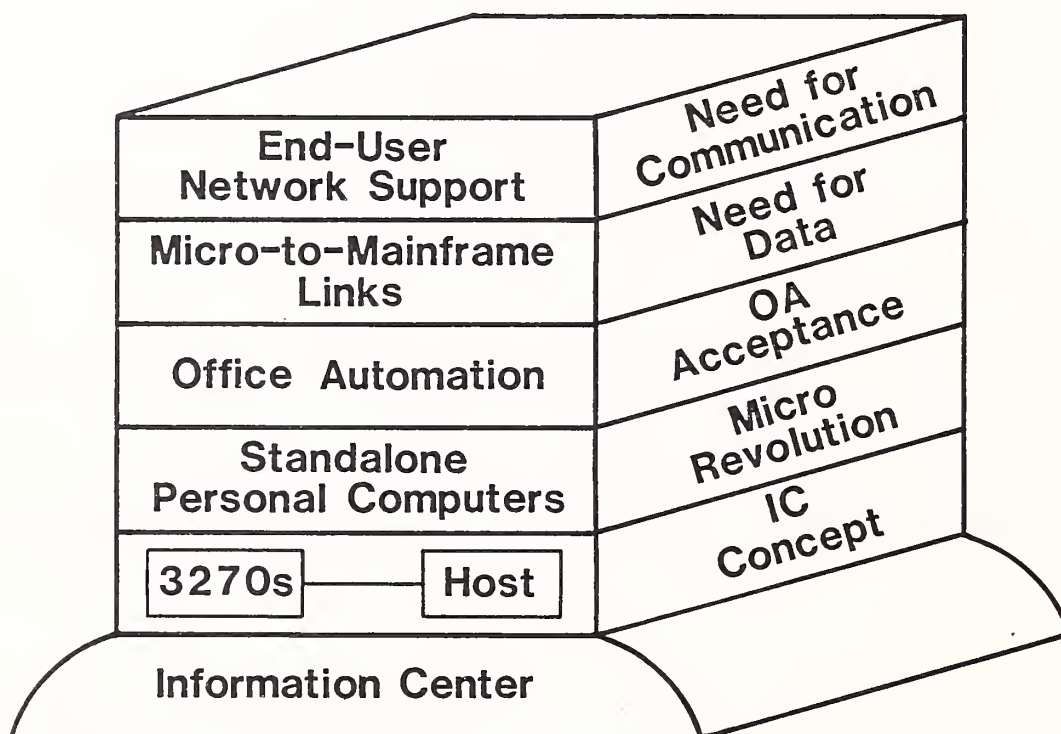
Modeling, etc. represents a continuation of the traditional DSS which will evolve to expert systems targeted to specific functions.

INTEGRATION EQUALS DDP



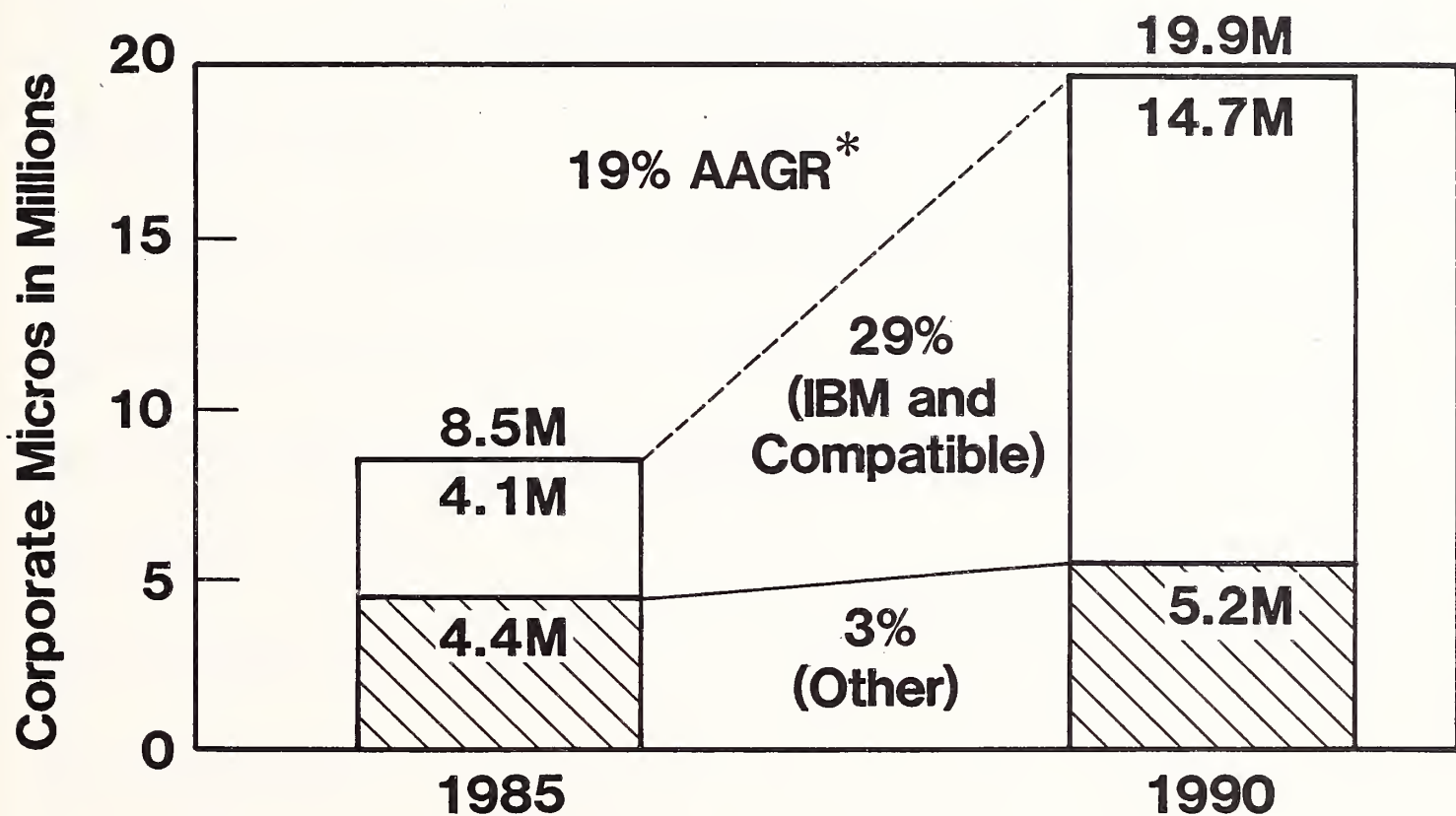
The integration of transaction processing (from central IS) with office systems (provided by office and departmental computers) with occupation specific applications (from information center and personal computers) means distributed data processing. This does not just involve using the same workstation for the different functions, however, it means that the software and data used to perform the different functions work together. In most cases we are a long way from being able to support DDP in this sense.

THE RESPONSIBILITIES OF THE INFORMATION CENTER ARE GROWING



The responsibilities of the end-user computing department which includes the information center are growing. They are being driven by the need for communication, particularly mainframe data access from micros, the acceptance of office automation and its extension to office systems, the rapid growth of micro workstations and the number of users needing support as a result, and the very concept itself of distribution of information from the host to the user, often today by 3270 terminals as well as micros.

CORPORATE MICRO GROWTH, 1985 - 1990



*Average Annual Growth Rate

Growth in the installed base of micros in corporate America will slow dramatically and will average 19% over the next five years. IBM and compatible systems will increase their dominance of the market, growing at 29%. Micros will be installed in future under control and with planned pay-offs, instead of the undisciplined manner of the early 1980s.

Micro-Mainframe
vs.
Micro-LAN-Mainframe
vs.
Micro-Mini-Mainframe

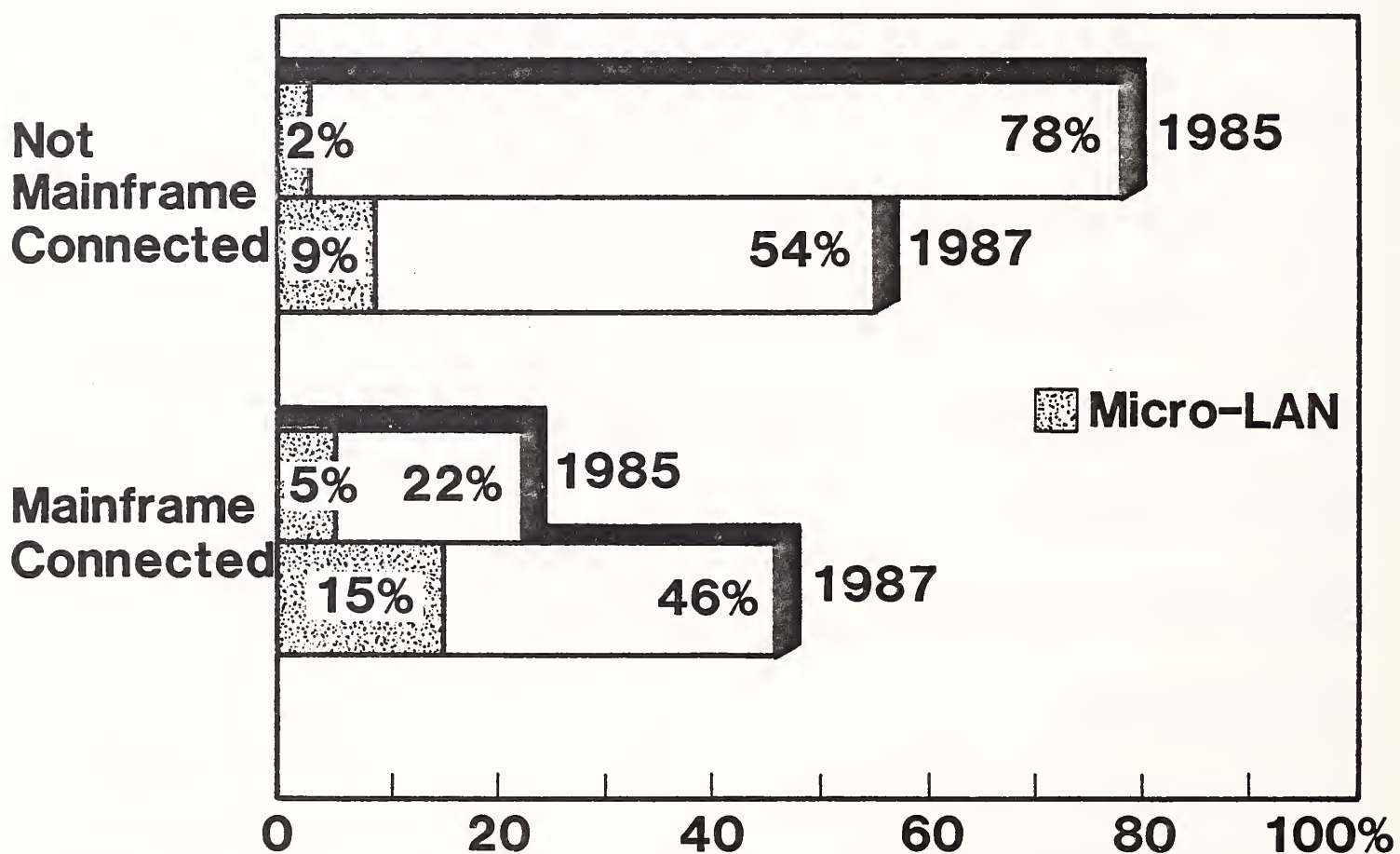
Perhaps the major issue in "connectivity" for micros is how it should be accomplished - should each micro be able to communicate directly with the mainframe using modems of various speeds and appropriate software or should communications take place through an intermediary, a LAN or a mini (supermicro)? In the LAN concept there will be one or more controlled gateways to networks, supporting multiple speeds, etc. This may be less expensive but provide for contention and other problems. The mini solution has similar problems but can support a hierarchical DDP structure.

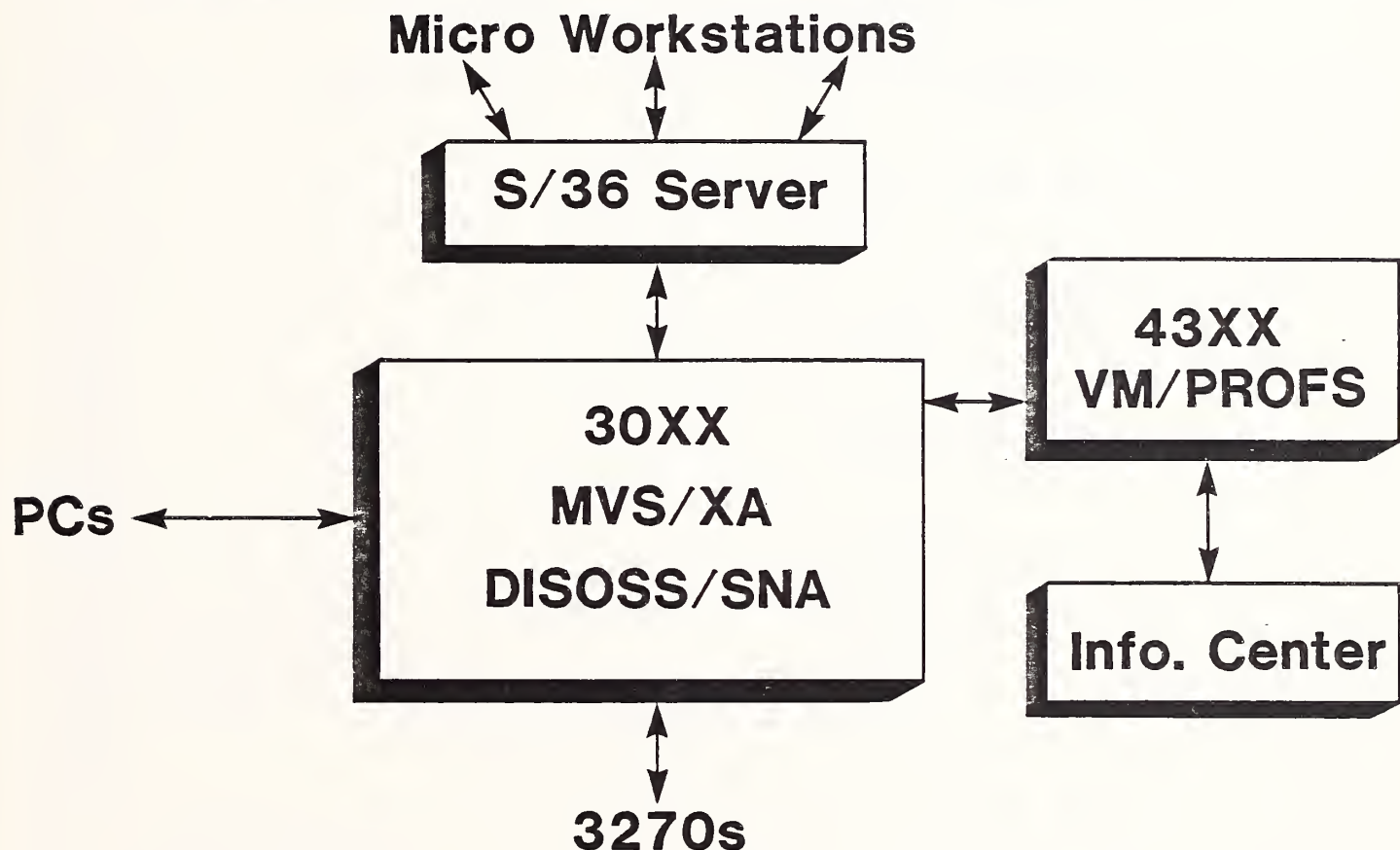
M-M DRIVING FORCES

Demand	Source	Priority
Decision Support Strategic Planning	Business Analysts/ Planners	Immediate
Performance Measurement Tactical Planning	Middle Management	1-3 Yrs.
Project Status Strategic Overview Forecasting	Executive Management	2-5 Yrs.
Transaction Processing	IS	> 3 Yrs.

Currently the application gap is delaying implementation. Organization issues are delaying implementation as much as technology.

MICRO-MAINFRAME CONNECTIVITY



IBM EMPHASIZES CENTRAL CONTROL

IBM will concentrate on DDP through SNA until 1990, then the office system era will begin.

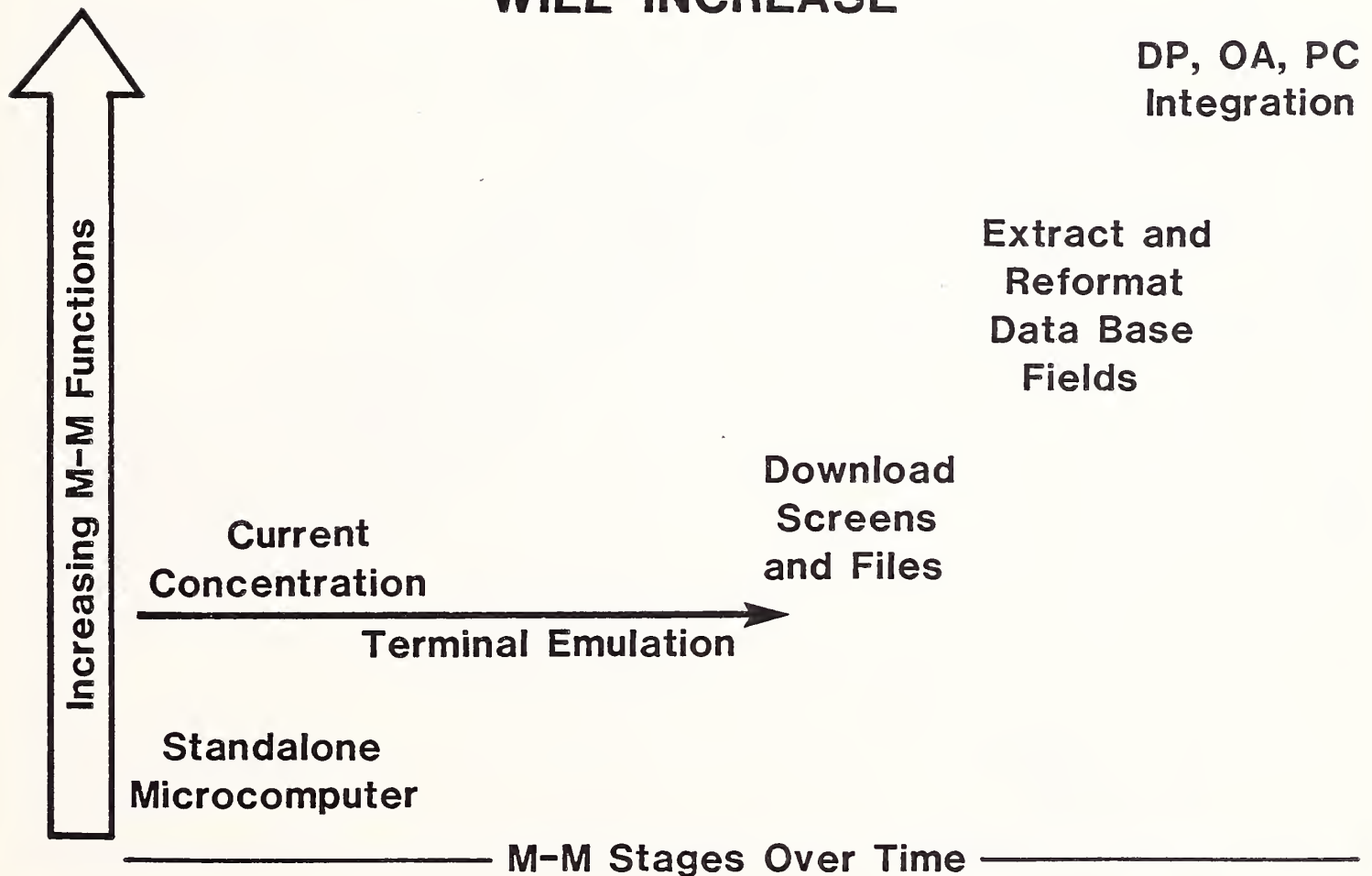
System/36 is being promoted as the workstation server by IBM - although the issue of the small 4300 and extended ATs impacts this. The key is that the software to support DDP with a PC/System/36/370XA environment is not available.

MICRO-MAINFRAME

- **Requires Increased Capacity**
 - **Processing**
 - **Storage**
 - **Network**

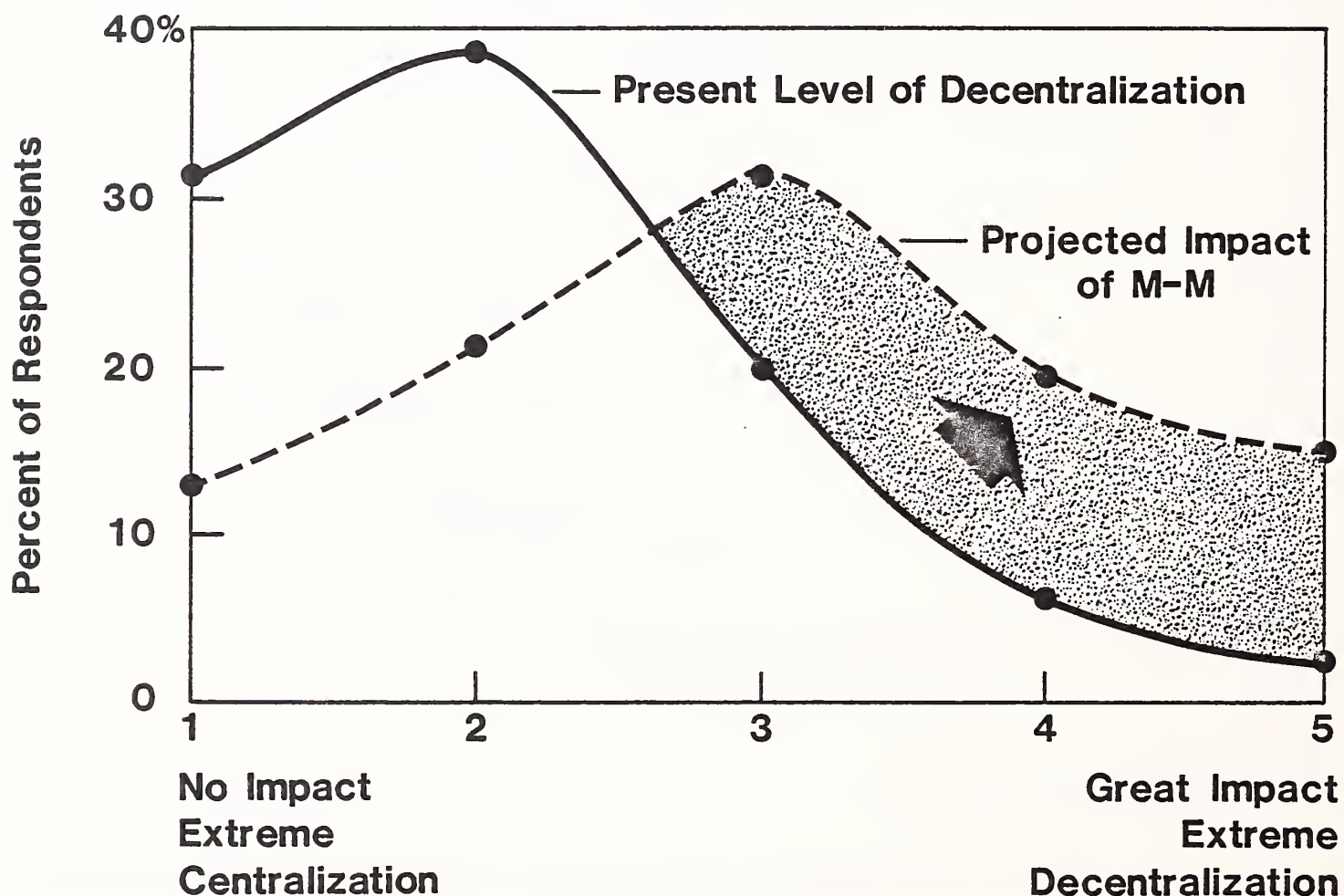
Although there is a wide divergence of opinion on the degree of central capacity required in a micro-mainframe environment a reasonable estimate seems to be a required increase in central capacity of about 20% in storage and processing over the next three years. This is probably an understatement in terms of storage - "virtual disk" will be a major storage support requirement.

DEMANDS FOR MICRO-MAINFRAME LINKS WILL INCREASE



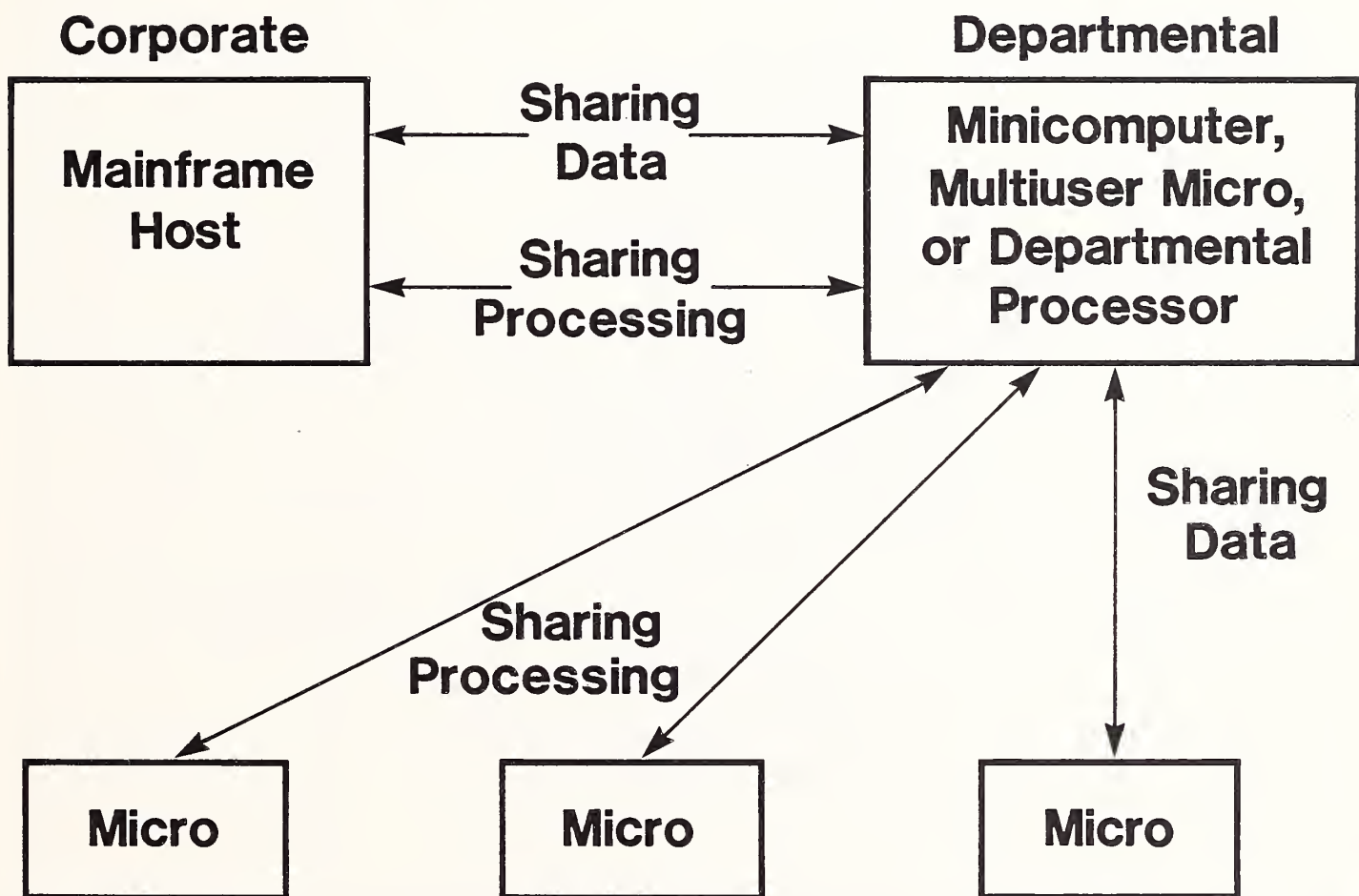
Today, for most users, we are in the terminal emulation stage of M-M connectivity. Although the demands will increase with time for function to be added, most needs can be satisfied at the downloading data stage and this may be as far as many users go in the near future. Thus the demand for M-M may not be as strong as, and will increase more slowly than, many vendors hope.

M-M IS SHIFTING I.S. TOWARDS DECENTRALIZATION



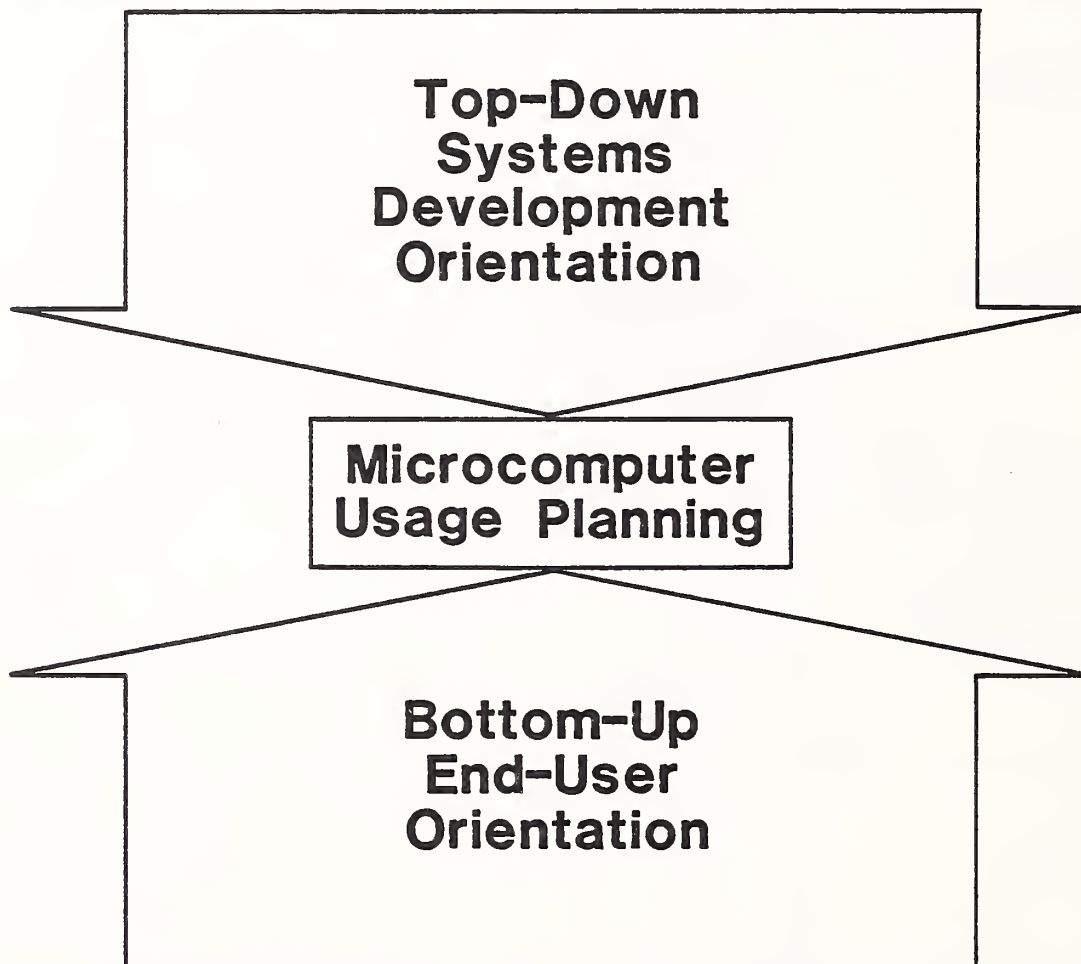
Is managers see the whole micro-mainframe phenomenon as moving the level of decentralization significantly forward (or backward, depending on your viewpoint.) However, micro-mainframe in INPUT's opinion represents decentralization of function but centralization of control.

THE FUTURE OF END-USER COMPUTING



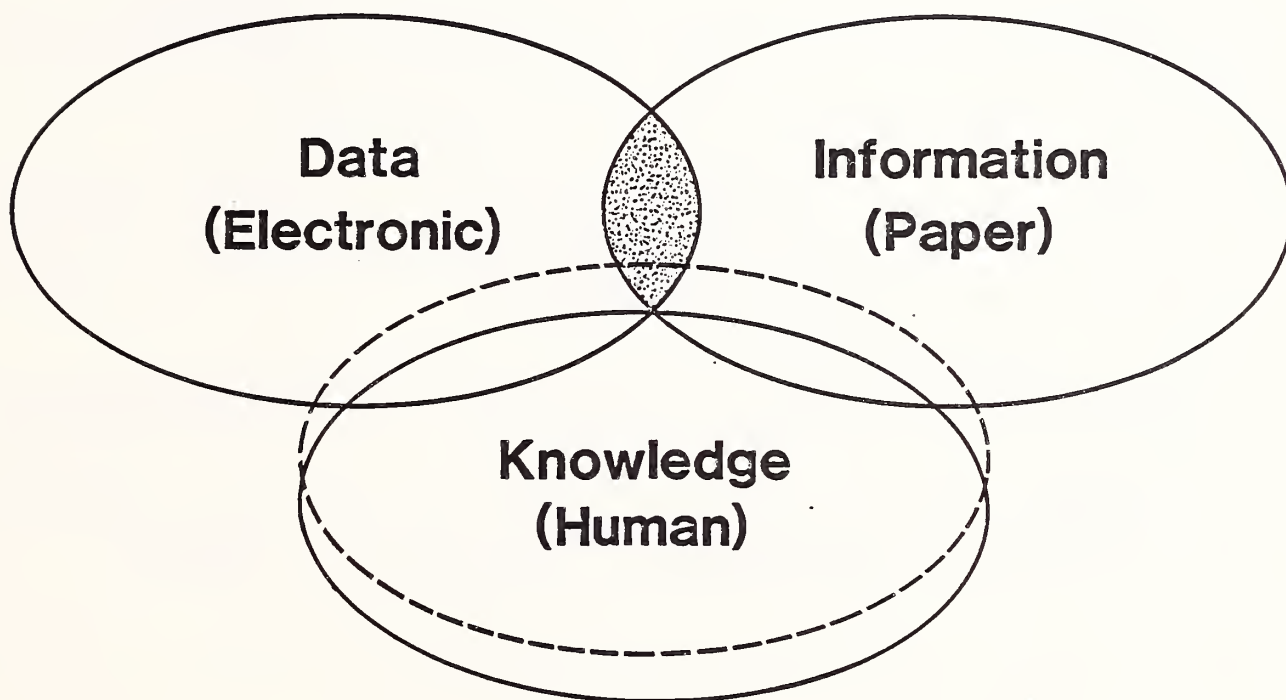
In looking at the future of end-user computing, the key factor is distributed data bases rather than distributed processing. The primary software required is to obtain, handle, and present information rather than to process it.

TOP-DOWN, BOTTOM-UP M-M PLANNING



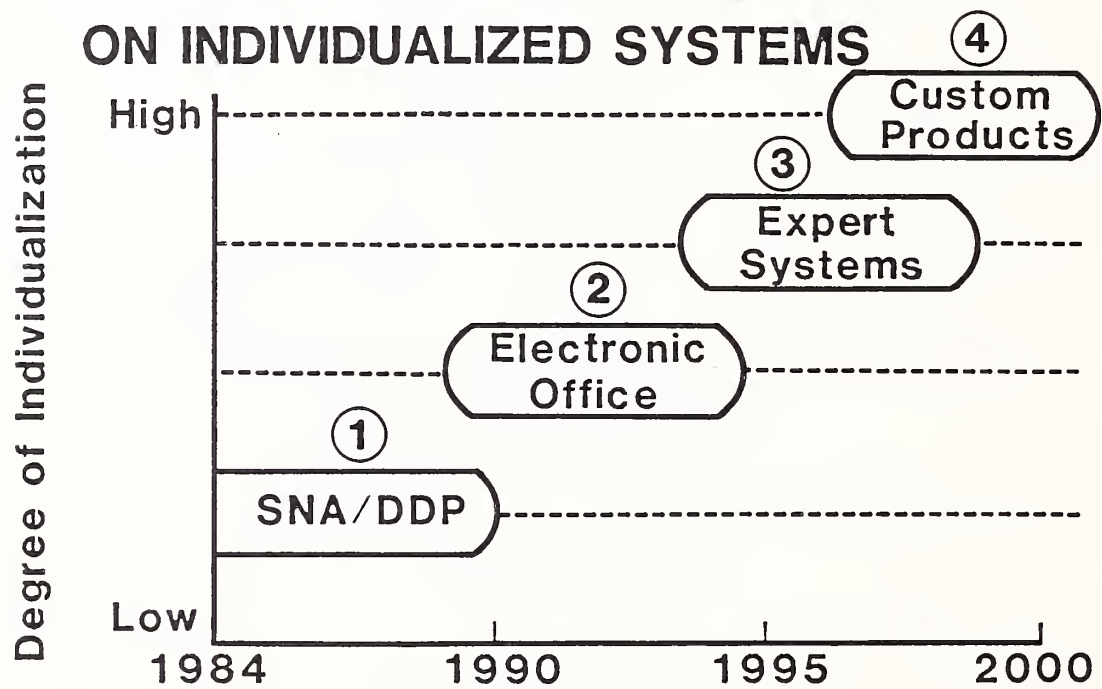
Office systems, including M-M, require a top-down approach - what is the business reason for the activity. What is occurring is a "bottoms-up", operational approach which may reduce productivity and benefit.

DATA, INFORMATION, AND KNOWLEDGE



Data are facts which today are largely available in electronic form. Information, the result to analysis of data and/or opinion is largely resident on paper. Knowledge, the result of human analysis of data and information is largely the province of the human brain. Expert systems are attempting to move this knowledge into intelligent electronic systems - but progress is very slow.

IBM STRATEGIES ARE FOCUSING ON INDIVIDUALIZED SYSTEMS



MEDIA INTEGRATION

<u>Base Type</u>	<u>Present</u>	<u>Future</u>
Data Bases	Magnetic	Optical
Information Bases	Paper (Files) Micrographic	Optical Paper
Knowledge Bases	Humans Paper (Books & Files)	Humans Paper Optical

Magnetic media is too costly to store significant amounts of data and information. Optical memory will replace magnetic for archival storage and raw data - magnetic memory will be used in processing. Optical memories will also permit the storage of significant knowledge bases such as those in text books - electronic systems will keep these up-to-date and provide easy distribution capability.

PROCESSING INTEGRATION

<u>Processing Type</u>	<u>Present</u>	<u>Future</u>
Data Base Processing	Mainframes	DBM, Mini/Micro
Information Base Processing	Human Interaction PC/WP, Graph.	Human Interaction Integrated Networks
Knowledge Base Processing	Human Interaction	Human Interaction Human-Computer Interaction

Data base processing is primarily in general purpose mainframe computers, information processing is through human interaction and document preparation, while knowledge processing is in the human brain or accomplished through human interaction.

Developments will permit integration of distributed data bases with voice, image, and text information, and the integration of these with humans who interact with systems to turn this into knowledge.

TELECOMMUNICATIONS IN TRANSITION

In the corporate hierarchy computers used to be much more important than communications - data communications was an addendum to computers. Voice communication was a low-level function. This is changing. Telecommunications (data, voice, office, image, etc.) is becoming more important and computers will eventually become mere nodes in the network. This radical change in emphasis requires radical change in thinking.

DEREGULATION AND WHAT IT HAS DONE

- **Confused the User**
- **Opened Up the Marketplace**
- **Increased Phone Costs**
- **Decreased Services and Service Levels**

Deregulation has not necessarily benefitted the user although it has certainly opened up the market. Confusion reigns, costs have gone up, and service levels decreased. How much of this is permanent, semi-permanent or temporary is not known.

DEREGULATION AND WHAT IT HAS DONE

- **Increased Competition**
- **Forced Companies to Adopt Bypass**
- **Pushed the Technology into New Areas, e.g., Satellite, Fiber**
- **Confused the User!**

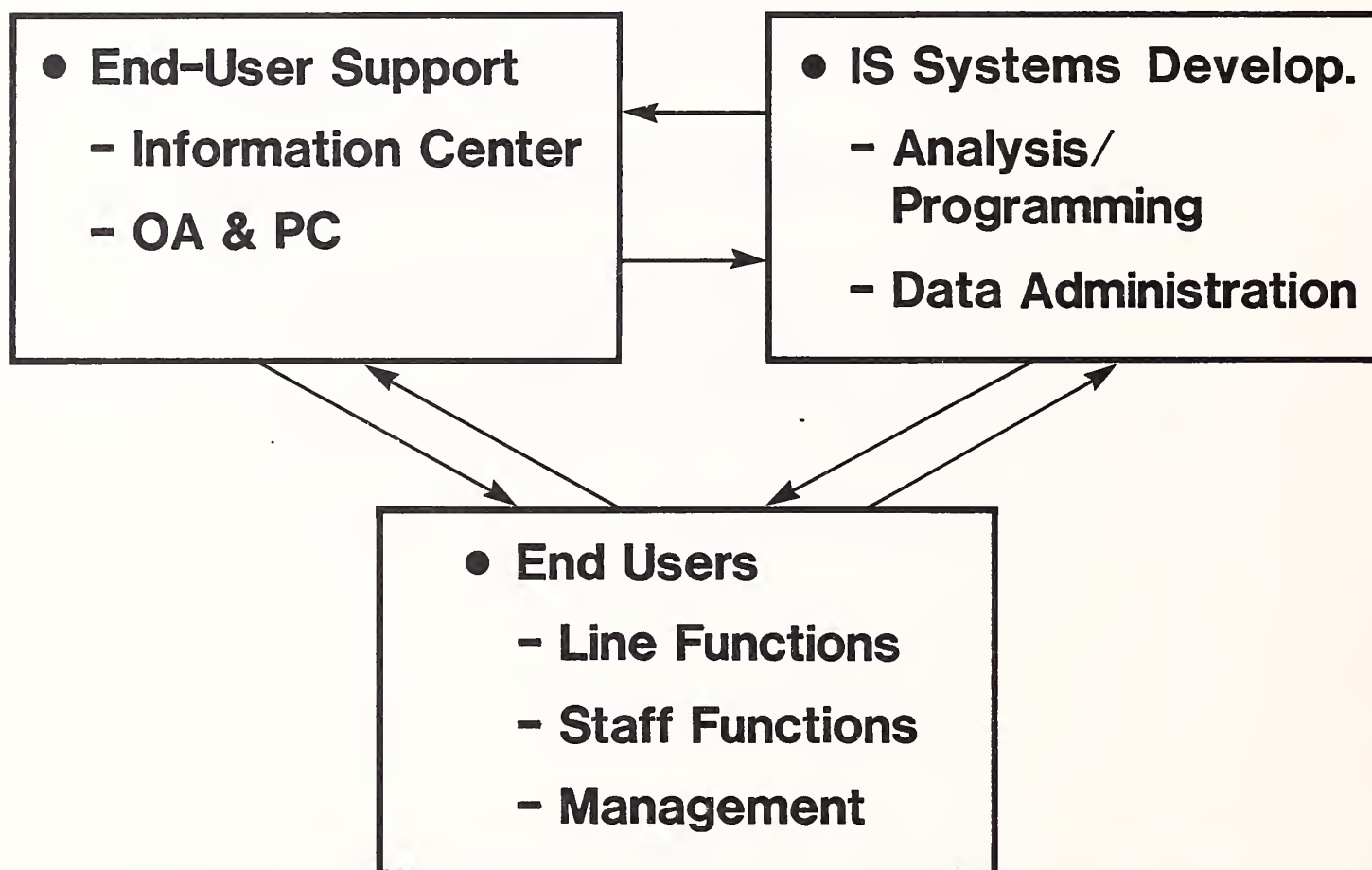
Competition has increased in terms of the numbers of competitors but it is not clear that this will reduce overall costs, as expected. Competition itself absorbs vast costs of advertising and marketing for example, which are reflected in prices.

Users, if they have not adopted bypass strategies are certainly examining them wherever possible because of local access charges.

New technologies such as satellite and fiber optic communications are being developed and marketed rapidly, sometimes too rapidly.

The final result, again, is confusion and cost for the user.

KNOWLEDGE EXCHANGE



In order to function effectively in future, channels for knowledge exchange must be established among the various units involved in systems activities. It is vital, for example, that end-user computing support functions be included in the analysis of projected new systems since they are continuously working with the users. Communication with users must be at several levels - it cannot be assumed that the users will transmit information internally themselves.

TRENDS IN THE DISTRIBUTION OF I.S. FUNCTIONS

Function	Corporate Information Systems	End-User Organizations
Systems Design and Development	C	PR
Applications Strategies and Integration	PR	C
Capacity Planning and Technical Support	PR	C
Standards and Guidelines	PR	C

PR = Primary Responsibility

C = Coordination/Consultation

INPUT expects that development functions will increasingly be owned by customers (end-users) as will be the "local" (divisional, departmental, personal) operations functions. However, all the planning, communicating and integrating functions will be the prime responsibility of corporate IS.

TRENDS IN THE DISTRIBUTION OF I.S. FUNCTIONS

Function	Corporate Information Systems	End-User Organizations
Voice and Data Communications	PR	C
Information Center Support	PR	C
Data Resource Management	PR	C
Training and Education	PR	C
Office Systems Development	C	PR

PR = Primary Responsibility

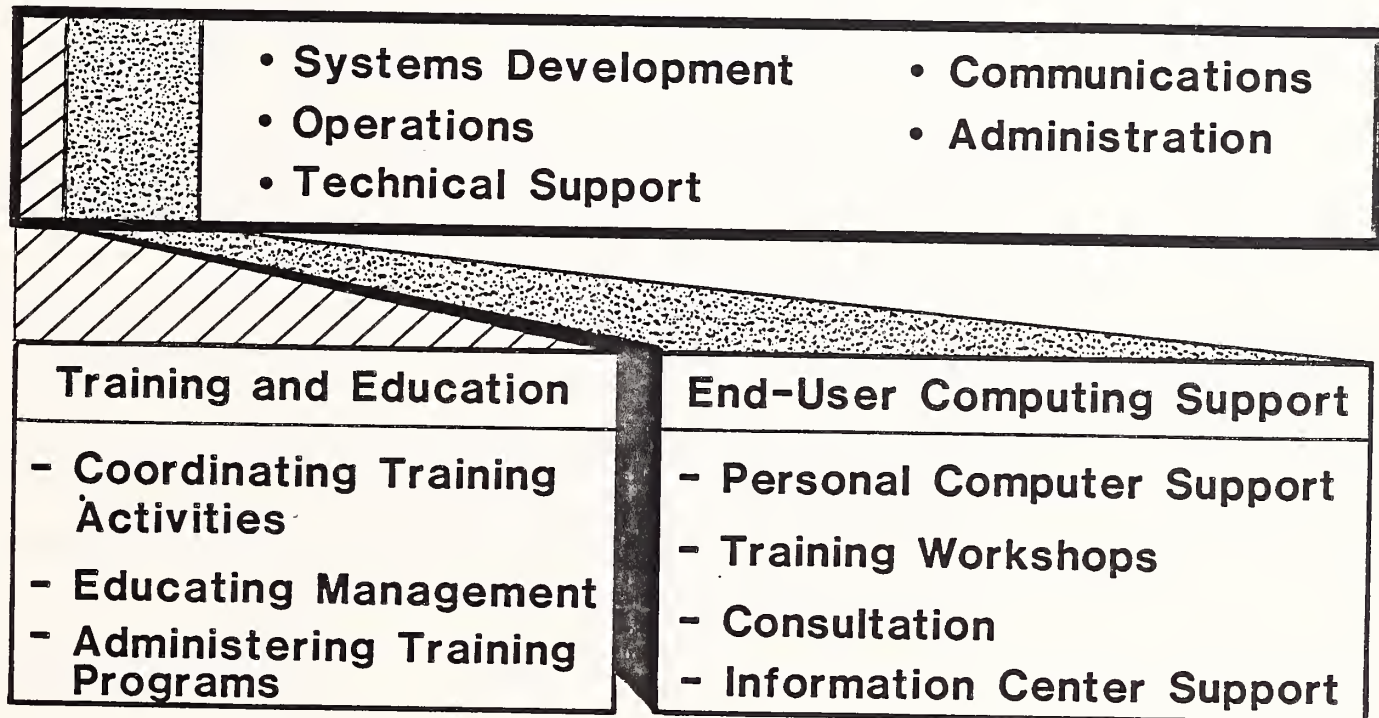
C = Coordination/Consultation

This particularly applies to voice/data (electronic) communication both within and without the organization. This is the area where office systems development and communication will most probably be in conflict - users attempting to automate their office functions while IS attempts to change them.

I.S. TRAINING FUNCTIONS SHOULD REPRESENT AT LEAST 3% OF THE TOTAL I.S. STAFF

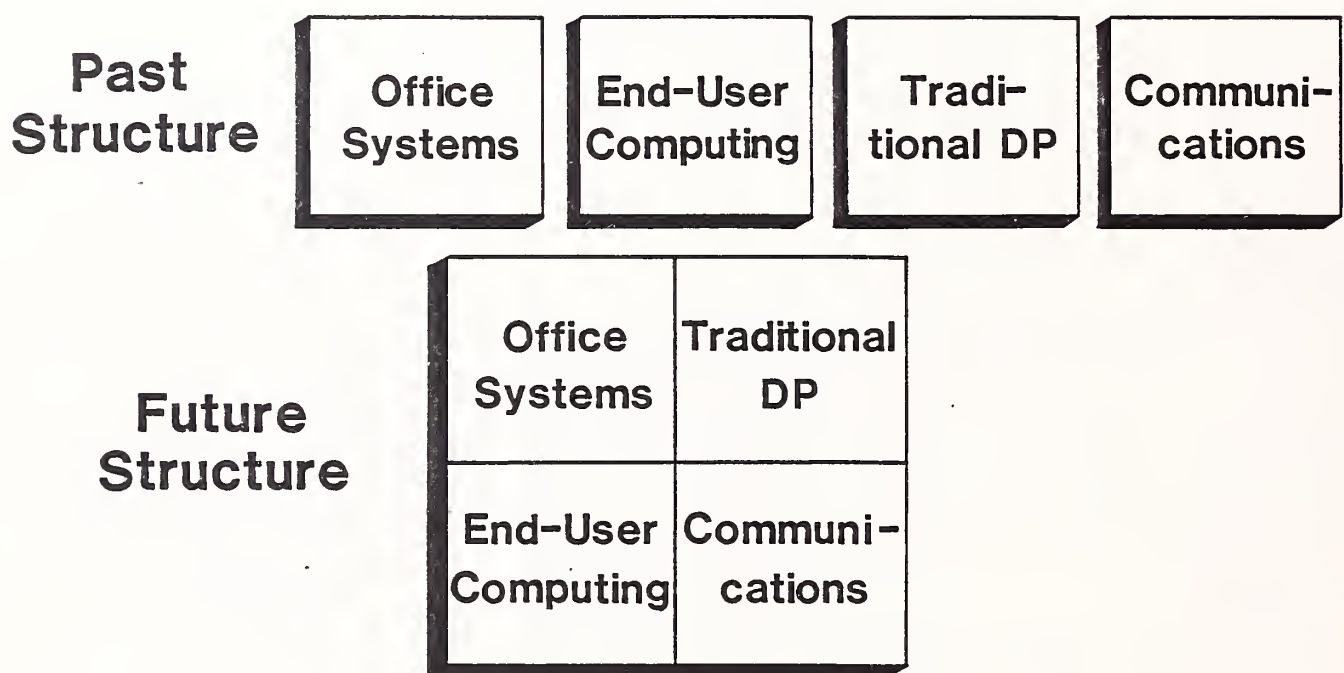
I S Department

3% 10%

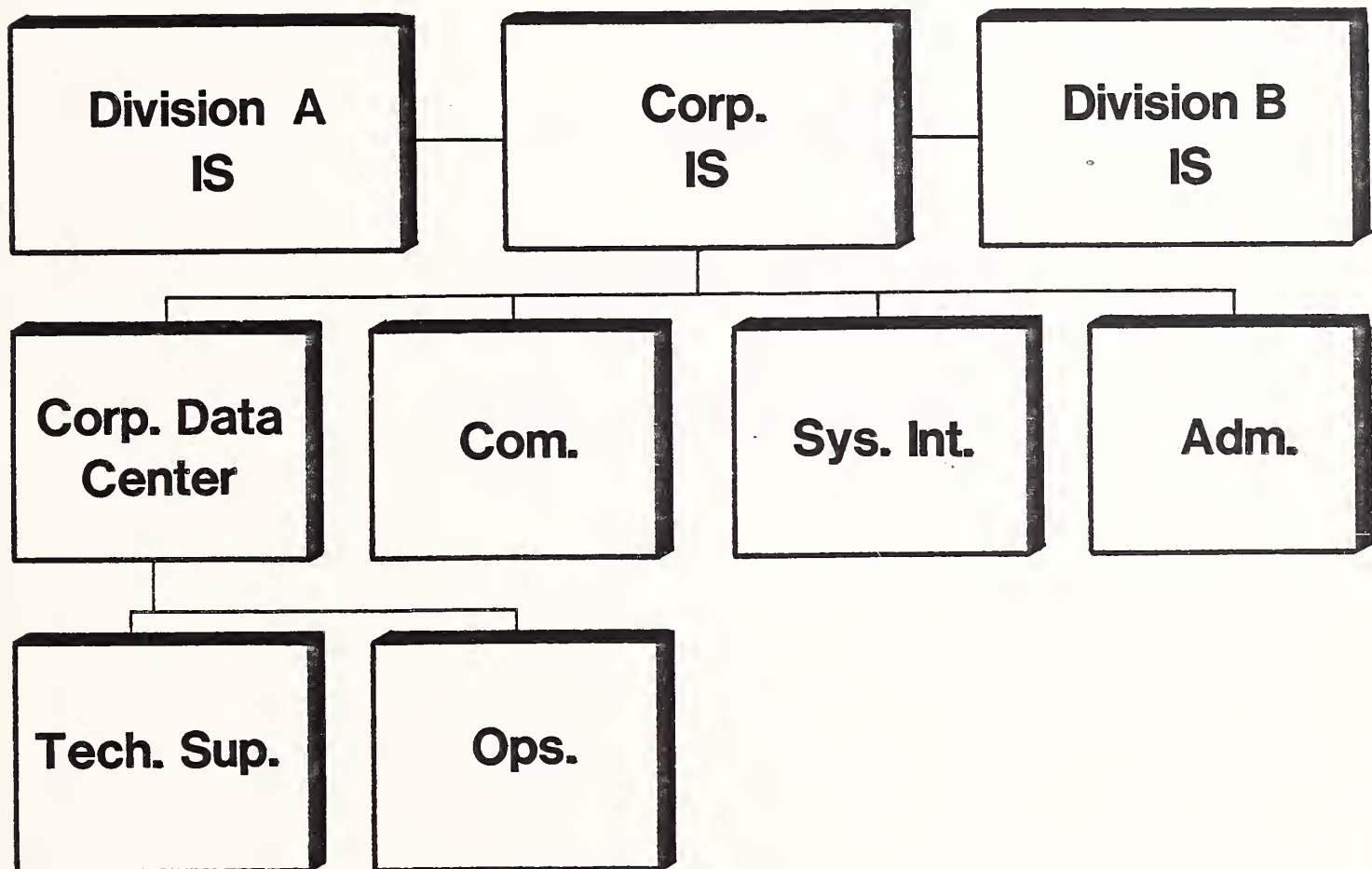


The role of the IS Department in Education and Training is vital - as well as being expensive. INPUT considers that the primary thrust here must be the education and training outside IS - spend \$4 for external training of managers, professionals and operations people for every \$1 of training and education for IS staff. Most of the external cost should go to education (What do you do with systems? How can they benefit the individuals, department, and organization?) rather than training in specific areas. The aim should be to spread systems knowledge and skills widely.

THE INFORMATION SYSTEMS ORGANIZATION WILL CHANGE



Today the IS organization is more fragmented than it has ever been. To be effective it must be pulled together. Just as decisions in the areas of telecommunications, office systems, end-user computing and traditional data processing can no longer be taken independently, neither can the IS organization function effectively with "autonomous" units supporting these functions. Integration along customer lines is the "order of the day."

DISTRIBUTED I.S. ORGANIZATION

In the distributed IS organization individual divisions may have their own IS functions (not always all of them.) But these will be coordinated, planned and controlled (i.e. managed) by the central organization. Essentially give the appearance of distribution but the fact of strong central control. This is vital in any area, such as communications, affecting inter-organization activity. It also emphasizes the efficient management of scarce resources, notably people.

I.S. FOR COMPETITIVE ADVANTAGE

Today, university professors, consultants and vendors are pushing companies to consider IS for competitive advantage. How is this being done? What examples are there?

COMPETITIVE ADVANTAGES OF INFORMATION TECHNOLOGY

- **Effective Decision Support**
- **Improved Customer Service**
- **Reduced Operating Costs**
- **Effective Sales/Marketing**
- **Improved Time Management**
- **Rapid Response to Change**

To provide a competitive advantage in decision support, decisions must be demonstrably better, e.g. reduced number of bad loans. Improved customer support often comes from tying-in directly to customer system - it also must be demonstrable even if it is simply the "perception" of the customers as opposed to reality. Reduced operating costs and improved time management are synonymous in labor intensive activities such as law offices. Most important perhaps is the impact on sales and marketing - increasing revenues while reducing costs, locking-in customers, and expanding markets. In all cases, it is easier to change computer systems than people!

IMPROVING SENIOR MANAGEMENT'S PERCEPTION OF I.S.

- **User Satisfaction Surveys
(Quality and Quantity) – Rochester Gas**
- **IS Included in Strategic Business Planning –
Connecticut Natural Gas**
- **IS Priority Committee of Top Management –
First Interstate Bank, Marriott, Nationwide Ins.**

Improving senior perception of IS is vital if it is to play a proper role in the organization development. Utilities have actually been in the forefront of accomplishing this. User satisfaction surveys on an organized repetitive basis are a "must" – but you must also report the results to management and customers. Perception, not necessarily evaluation, is also improved by inclusion in strategic business planning. It is also important to have IS priorities established by the key people in the organization, as at Marriott and others.

**INFORMATION TECHNOLOGY
IN COST REDUCTION
AND CUSTOMER SERVICE**

Marriott Corporation

- **System/36 for Each Hotel**
- **More Autonomy to Hotel Operation**
- **Host Connectivity**

**INFORMATION TECHNOLOGY
IN COST REDUCTION
AND CUSTOMER SERVICE**

Marriott Corporation

- **For Local Back Office Accounting**
- **For Improved Food/Beverage Management**
- **Series 1s and PCs Linked to S/36
(Guest Acctg. and Property Management)**

INFORMATION TECHNOLOGY IN COST REDUCTION AND CUSTOMER SERVICE

American Hospital Supply Corporation (AHSC)

- **ASAP Automated Order Entry System**
- **AHSC's Customers Tie into System Via
Micros, Terminals, Minis, and Mainframes**
- **Saves AHSC \$6 Million per Year**

Not only does the ASAP system save AHS \$6 million per year, it also gives it a major advantage in its selection as a vendor by allowing direct entry through a variety of customer terminals. The system is a significant barrier to entry to other vendors.

INFORMATION TECHNOLOGY IN COST REDUCTION AND RESPONSE TO CHANGE

Hughes Aircraft

SNET

- **Substitute FGL for COBOL
in Major Systems
Development Projects**

Hughes Aircraft and SNET are examples of companies that are changing to FGLs to reduce implementation time and cost for major systems while also providing more flexibility in adjusting to change. Reducing cost here is not the cost of computers for development and processing but is the labor cost, which is by far the largest factor.

INFORMATION TECHNOLOGY IN CUSTOMER SERVICE

General Motors, Buick Division

- Videotex to Dealers
- Auto Configuration
- Finance Determination
- Order Tracking

GM has been introducing innovative technology into its distribution system for several years. It distributed several thousand optical disk systems for use by maintenance. Now it is installing Videotex systems in Buick dealers to assist in the complex auto configuration area dealing with the wide range of options available with American cars, and also financing options.

INFORMATION TECHNOLOGY IN RESPONSE TO CHANGE

Marriott Corporation

- **Distributed Systems Service Department**
 - **Technical Expertise to Systems Development Departments (e.g., POS, Office Systems, Personal Computing)**
 - **Direct Client Contact or Project Assignments**
-

INFORMATION TECHNOLOGY IN SALES

American National Insurance

- **250 Micros Installed in Agencies**
 - **Custom Proposals for Interest-Based Investment Policies**
-

INFORMATION TECHNOLOGY IN DECISION SUPPORT

SNET

- **13% of IS Staff Assigned to End-User Computing Support Group (60 People)**

Nationwide Insurance

- **2,000 Information Center Users**
 - **600 Personal Computers**
 - **Information Dissemination to All Levels**
-

INFORMATION TECHNOLOGY IN CUSTOMER SERVICE

American Hoechst

- **On-Line, Voice Recognition
Order Entry System**
- **Electronic Document Interchange
with Customers and Vendors**

Again in customer service and order entry, American Hoechst is using EDI to distinguish itself from competitors. In addition it is using voice recognition in test as part of an order entry system.

INFORMATION TECHNOLOGY IN SALES/MARKETING

Monmouth County, NJ

- Videotex in Real Estate
- Search by Price, Area, and House Size
- Property Location and Community Information
- AT&T Manages the System

Other videotex applications being tried include an AT&T system in support of real estate dealers in Monmouth County, NJ. It enables customers to search for houses with desired characteristics without as much trouble. It essentially is an extension of a multiple listing service.

CONCLUSIONS

HIGH LEVEL STRATEGIC TRENDS

- **IS as a Profit Center**
- **Managing IS through High Level Steering Committee**
- **IS Moving Up in Visibility**
- **Marketing IS Services**

At the highest level of strategic trends for IS we see a move again to IS as a profit center. As well as the traditional bank and aerospace subsidiaries, new IS service subsidiaries are emerging in utilities, transportation, etc. These companies increasingly treat their internal users as "customers" and are marketing their services. IS is moving up in visibility as its strategic importance is recognized. In order to address all needs as effectively as possible the steering committee concept is widely accepted.

STRATEGIC OBJECTIVES

- **Install Critical Systems**
- **Address End-User Computing**
- **Improve Allocation of Scarce Resources**

Current strategic objectives for IS are to some extent in conflict. Rapid, economic and effective installation of critical systems often require as much skilled resources as are available. Yet, in order to properly address end-user computing in an integrated, controlled manner, it is necessary to both consider end-user computing interrelationships with the critical systems and to use some of the scarce resources, namely people, to support it. The allocation of people is a particularly important area today since the relationship between IS and the user community is so sensitive and people dependant

I.S. AS STRATEGIC WEAPON

- **Analyzing Competition**
- **Response**

In terms of treating IS as a strategic weapon, management must constantly analyse how their competition uses or plans to use IS and must have response plans available. Thus intelligence collecting and competitive analysis become vital roles for IS. Afterall, the Japanese have shown how effective this can be.

FUNDAMENTAL QUESTION OF BENEFIT FROM I.S. INVESTMENT

- Where's the productivity?

Another factor, however, is that senior management is asking the questions "Where's the productivity?" "What am I getting from my IS investment now?" Until they get satisfactory answers they are not spending for new procurements.

For example, at the same time that Max Hopper at Bank of America is planning to spend \$5 billion over the next 5 years on IS, a corporate team is evaluating what they are getting from current expenditures, including those on development.

In most companies 40% or more of IS expenditures can be tied to new development. If that were shut down there would be an immediate positive impact the corporate "bottom line." The problems would occur in the future.

LAW 1

**Rate of Supply >
Rate of Absorption**

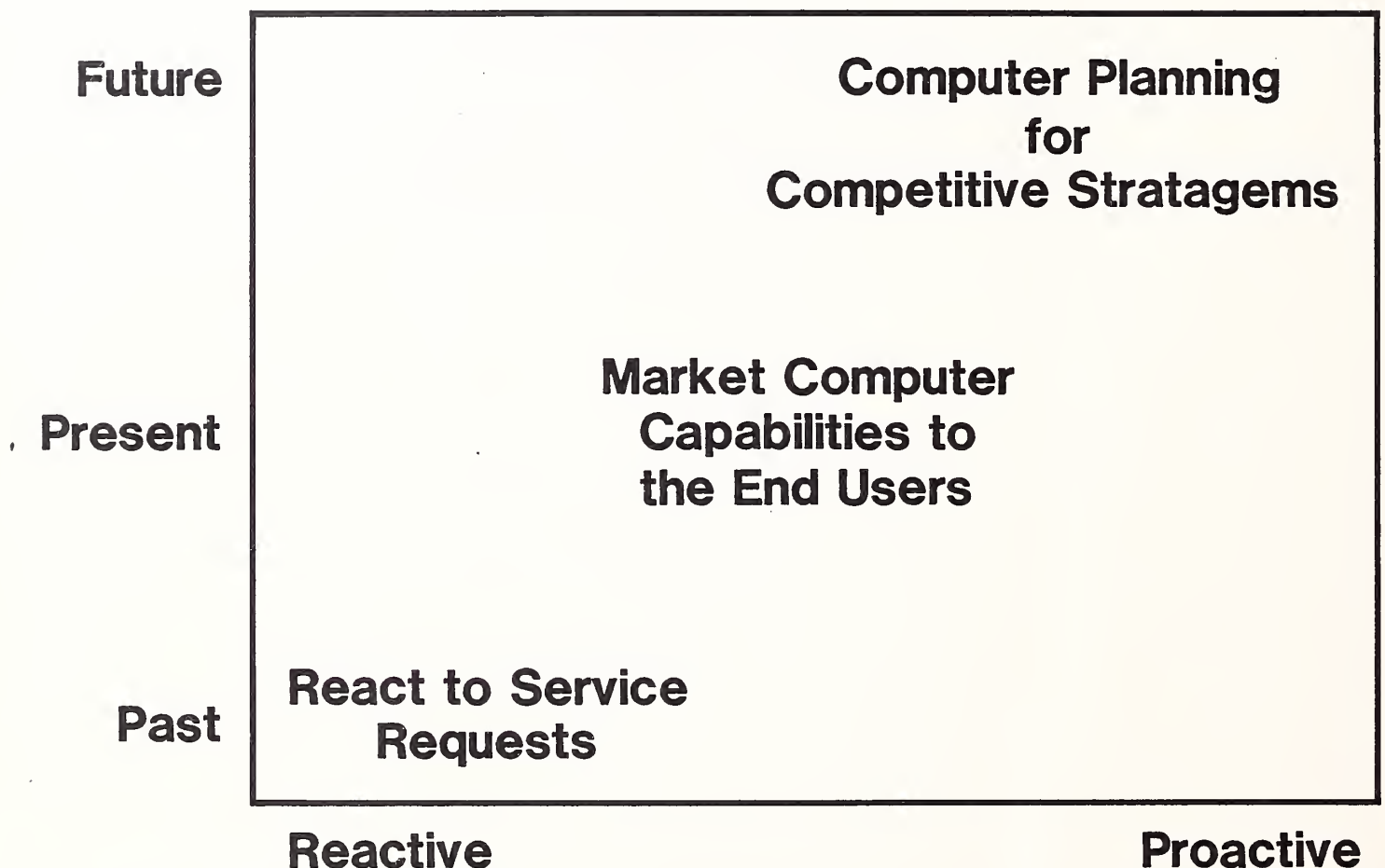
There are two basic laws we think describe the current situations. INPUT's First Law states that the current rate of supply of IS technology is greater than the rate of absorption. The rate of absorption is governed by people and organizations. They cannot change as quickly as we can install terminals and computers and, indeed, software. People require education, training, organization, direction, procedures, policies, management, etc. Systems that we install today affect people in their workplace - they no longer sit behind locked doors in the "glass house." Installation processes slow down the industry because they take time. In planning we must recognize that we cannot adjust the people to the technology as much as we might think.

LAW 2:

**Rate of Change <
Length of Decision Process**

INPUT's Second Law states that the rate of change of IS technology is less than the length of the decision process. Again and again we see well thought-out analytical decision processes which produce results which are obsolete because the world has changed while the process was taking place. The number and types of new hardware and software products is growing very rapidly adding to the complexity of the decision process, which combined with increasing involvement of users and management, and the different impacts on people and parallel systems has increased major decision process times to a year or longer. In the present IS technology creative explosion, a year is forever. The only way to deal with this is to plan and predict more effectively.

I.S. MUST ASSUME LEADERSHIP



In many companies today IS has already moved from a purely reactive stance in servicing computer and communications requests to actively marketing the capabilities of IS to management and end-user organizations. The next stage is a strongly proactive environment where IS is involved as an equal, or even senior, partner in planning the competitive structure and strategies of the organism.

Period of IS Assessments

Today, we are moving into, or have already entered, a period of IS assessment. This ranges from evaluating what a company is getting today in return for its current expenditures to ~~XX~~ identifying the role of IS in restructuring the entire organization. At the same time organization responsibilities and roles are being evaluated - particularly related to the level of distribution /decentralization. Who should make what decision? How much should be spent? What are our competitors doing? How to interface the office, communications and computers? These are all assessments being made today. The answers are not easily obtained!

